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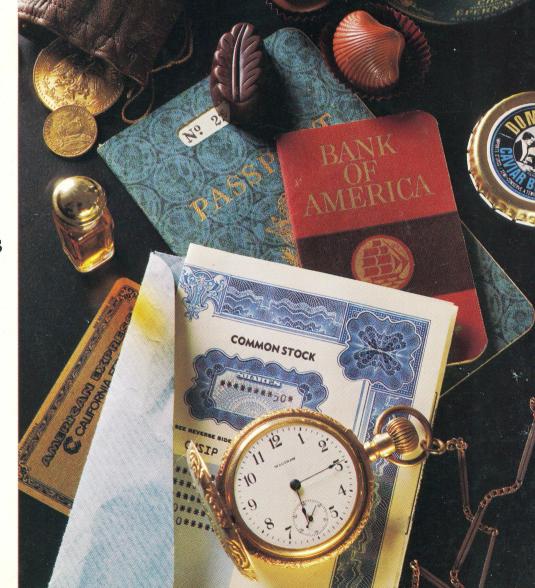
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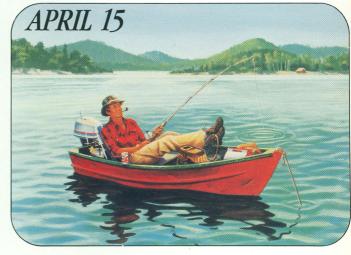
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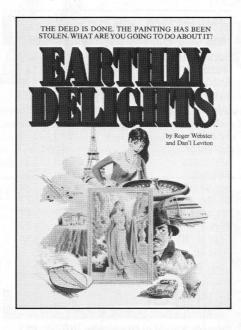
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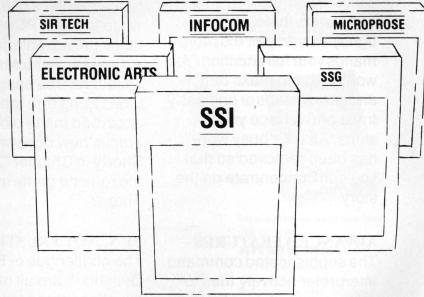
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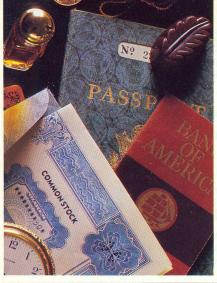
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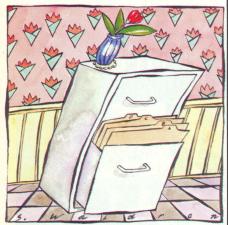
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SOTTO VOCE

MAC: Not Too Big a Bite For the II to Chew?

by MARGOT COMSTOCK

A LITTLE LOCAL COLOR

At last autumn's AppleFest '85 in Long Beach, California, Macintosh seemed at first sight to rule the day. So it was hardly surprising when a bright color monitor screen shouted for attention with a beautifully detailed drawing of a Macintosh, complete with mouse. But instead of being Apple Beige, the Macintosh case on the screen was brightly pied in brilliant colors. Next to it was a simple statement: "There are still some things only an Apple II can do." The machine upon which a young woman was creating that "color" Mac was indeed an Apple II.

By the time you're reading this, there may indeed be a color Macintosh — grating all the more on the souls of loyal Apple II devotees. But even for us, there's an awfully good aspect to the Mac: it's had a super effect on what's available for the Apple II.

THE DAYS OF WINE AND ROSES

Four years ago, programmers and hardware designers marveled at the Apple II. "It's five years old," they'd say, "but we haven't begun to see its limits yet." Time after time, innovative programmers fiddling around with the II keyboard would make breakthrough discoveries. Consider Bob Bishop, back in 1981, fiddling his way into a true diagonal line—and the roots of double hi-res—when lo-res was still acceptable and hi-res was mostly black and white.

Only three years later, around the time Mac'n' Lisa made the scene, those outspoken programmers began singing a different tune.

THE MOON AND I

"I still like the II better," many would say; "but we've done just about all we can with it. I guess it does have limits. After all, it's essentially seven years old, and in an industry like this . . ."

Other programmers, evidently, don't talk so much. And, apparently, if they listen, they don't pay much attention. It seems that, like Bob Bishop way back when, they just do. A lot of those Apple II people looked closely at the Macintosh and its software and responded, "Who says a II can't do that?" and, "Why not?" The result is a spate of new programs and products that give Apple II owners many of the advantages and fun of having a Macintosh—with the II's own considerable advantages thrown in.

And the result of *that* is that, somehow, just about everybody's lost sight of the II's limits again. Woz must be chuckling a lot.

JUST MOUSING AROUND

The first openly Mac-like products came from Apple: Mousepaint and the Mouse for the Rest of Us. But they were mere hints of what would follow. Even before that, Bill Budge presented Mac-like icons, facility, and technology in The Pinball Construction Set, and Robert Woodhead produced the first Apple II MacWindows in Wizardry III: Legacy of Llylgamyn. (A really old saw that some sober souls can't seem to grasp is that those big advances always seem to show up in entertainment software first.)

Now there's a slew of products. Roger Wagner, one of the earliest and most faithful innovators for the Apple II, has just brought out MouseWrite, a word processor for the II. Pull-down menus give MouseWrite the simplicity of the Mac environment, and the program provides mouse editing that's as easy as MacWrite's—which is super easy—while keeping the nonmouse options that make writing itself smoother.

Continued on page 9

Margot Comstock was cofounder and editor of Softalk. It was great fun, but it was just one of those things.

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SOTTO VOCE

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Mouse drawing with Dazzle Draw from David Snider and Broderbund is a lot like MacPaint's and MousePaint's, but you can opt for joystick, graphics tablet, or KoalaPad if you prefer. Mac-like pull-down menus make using the program easier than any previous Apple II graphics program, for people who just want the fun of making pictures on their computers. (Unlike Broderbund's Print Shop, Dazzle Draw is somewhat limited in its printer options, a result, according to rezzy Broderbund prezzy Doug Carlston, of the greater demands made on printers by double hi-res graphics.)

НІ-НО, НІ-НО

But the biggest news has to do with a program for the Apple II that Mac hasn't come close to: AppleWorks. (Well, Mitch Kapor's Jazz isn't to be sneezed at, but for simplicity of use....) Some sort of to-do between Apple and the inspired Apple-Works author Rupert Lissner prevented the advent of either a mouse-driven option for AppleWorks for the II or a Mac version of the multiple program. But the package is still just about the supreme basic tool for the II and most of us have it. The loyal-to-II Macwatchers have noticed.

Among the most fun features of Macintosh are the desk accessories. Clicking the mouse on a little bitten Apple in the top left corner of Mac's main window screen reveals a menu of these handy gadgets. Software producers can leave them out of their products, but most don't. They're things like a calculator, notepad, scrapbook, clock, and even a little puzzle that can be activated and used during the running of any other program, without closing that program or even losing your place. If you're writing a letter about budgets and you need a calculation you forgot to make, you just open the desk accessory calculator, compute your answer, and put it in your letter.

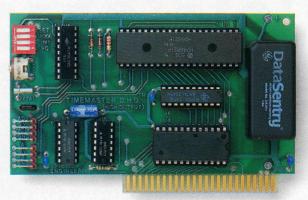
LITTLE THINGS MEAN A LOT

Now from Pinpoint, a new-old company consisting primarily of the two gentlemen who brought us Micro Cookbook under the company name Virtual Combinatics, comes AppleWorks Accessories. In fact, the nine desktop accessories in the program will work with most ProDOS programs, but they're especially nice with AppleWorks because they use the same commands. And the accessories the people at Pinpoint have chosen surpass the utility of those provided with most Macintosh disks.

Besides the calculator and notepad, Pinpoint's desktop provides an appointment calendar; a miniterminal program, so you can use your modem

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without interrupting the project you're working on; a telephone dialer, which finds any telephone number on screen and dials it automatically for those of us too lazy (or otherwise occupied) to punch the buttons; an addresser, which finds the addresses on letters you're writing and automatically prints them out label style on envelopes; cut-and-paste tools for swapping information among programs (not just among AppleWorks files); a similar facility for putting Dazzle Draw or MousePaint pictures into AppleWorks text files; and finally a typewriter—well, sort of: the ability to jot a note that the printer prints line by line as you type it.

THE MOUSE WITH JE NE SAIS QUOI

AppleWorks was first, and it's got a heck of a head start, but it's not the only game in town. Thanks to the Mac influence, other companies are coming out with similar programs, and, like MouseWrite, making use of window menus and the mouse to boot. International Solutions, a company peopled prominently with former Apple Inc.

The result is a spate of new products that give Apple II owners many of the advantages of having a Macintosh.

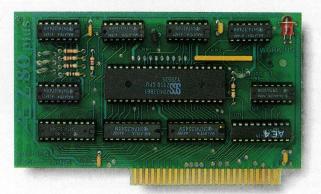
Apple IIers, including original IIc honcho Dave Larsen and public relationist Renee Olsen, is importing (and Americanizing) software with a French accent. The programs, which share functions and interface in various ways, all use mouse technology and claim to be Macintosh simple to use.

Mouse Word, the word processor in the family, has a bunch of built-ins: communications for modem use; mail merge for merging form letters with lists created on Mouse Word itself or on any ProDOS-based database; and a complete calculator function, which also works along with the merge feature to do billings.

Though the companion programs don't really form an integrated package, Mouse Word has the capacity to cut and paste financial tables from Mouse Calc, a spreadsheet program with graphing capability that ISI claims is already a bestseller in France. Finishing out the family is Mouse Budget, a mouse and menu driven home accounting program. Later this year, ISI plans to introduce Mouse Desk, which is—you guessed it—another set of Mac-like desk accessories for the II.

continued on page 13

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SOTTO VOCE

continued from page 11

Even SoftSync, whose original claim to fame was the world's most comprehensive line of software for the rather absent-minded Sinclair, is in on the Mac act for Apple II with an apparently selfcontained set of five desk accessories, the main one being a simplified word processor.

AS HIGH AS AN ELEPHANT'S EYE

And that's not all. Or maybe not all. How much credit can we give to Mac? For nearly a year before the Macintosh interface arrived (originally faithfully called Lisa Technology—but Everyman seems to have prevailed over the one-night stand....), advance and freshness were at a virtual standstill. That new look seemed to put the squeeze on the creative juices, so that it's tempting to give Macness credit for a lot of progress—at least progress

Those big advances always seem to show up in entertainment software first.

in quality—even when the outcome doesn't use windows and mice.

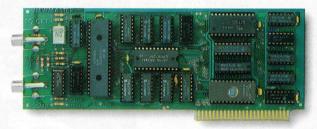
Quite a few programs fall into this realm: the interactive fiction series from Synapse/Broderbund, the Wizardry-like Bard's Tale from Electronic Arts and Newsroom from Springboard are just a few outstanding examples. Even the Ultimas, III and IV, show the influence of windowing, although the continuously developing genius of Richard (Lord British) Garriott is not to be attributed to any trend.

SHUT THE DOOR, THEY'RE COMING IN THE WINDOWS

With the originally disrupting (their existence caused several programs, including Apple Writer IIe, not to work properly on the IIc) Mac-style windowing characters supplied in the Apple IIc, and Apple's \$70 upgrade to include those and other IIc features on the IIe, there are bound to be many more exciting, Mac-like programs.

So, Apple II lovers, let's hear it for Macintosh. At a time when discouragement was encroaching and invention sitting just out of mind's reach, Macintosh's innovative style and inviting personality lured the doers out of the doldrums and opened up a new world of wonderful products for our Apple IIs.//

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Home Banking: Who Needs It?

by PAUL COHEN

very day Americans write more than 200 million checks-most of them good. Forty billion transactions a year, and over 90 percent of all money spent in this country, are covered by checks and credit cards. And as the banks handling all that paper have become increasingly competitive under deregulation, they not only have had to sell the quality of their services, but also to improve efficiency. So it was inevitable that some forward-thinking bankers realized that all the number crunchers sitting on their customers' desktops could help cut the paper flow. Using telecommunications networks to link personal computers with their own systems, banks hope someday to achieve a huge savings in operating costs-and just maybe provide a worthwhile service to their customers. Thus is born a new computer application-what has been called, from the consumers' point of view, a solution in search of a problem.

HOW MANY TAKERS?

In the last three years, dozens of banks and some 60,000 customers nationwide have invested in video banking services. That's less than half the number of subscribers analysts had predicted by the end of 1985, and a lot of bankers are going back to their spreadsheets to recalculate their return on investment. But some of the biggest banks in the country are committed to home banking, and if you own a computer and modem, chances are they'll be try-

ing to sell you their services.

Video banking allows you to pay bills, check account balances, transfer funds from one account to another, review past or current bank statements and communicate with the bank via electronic mail. You get to the bank by dialing a toll-free "800" number, or logging on to a database network like Tymnet. Once online, you enter a series of passwords and user ID's to access your account. Each transaction is confirmed with a reference number onscreen, and appears with other banking activity on your regular monthly statement. With their multilayered sign-on codes and system lockouts, the banks are confident their systems are secure. In any case, federal regulations limit customer liability to \$50, if banks are notified of unauthorized transactions within two business days.

While the basic functions of home banking are fairly standard, systems vary in power, versatility and configuration. Most major services - Chemical Bank's Pronto (the industry leader with nearly 30,000 subscribers), Chase Manhattan's Spectrum, Citibank's Direct Access and Manufacturers Hanover's Excel - are "closed" systems which can be accessed only with software supplied by the bank and embedded with your own codes for logging on. Bank of America's HomeBanking—the second most popular service with more than 20,000 subscribers-is an "open" system that can be accessed with any type of computer and modem. These systems are limited to specific makes of computer, though all support the Apple II line.

"We've seen the evolution of banking services since the 1950s," says Paul Ayers, vice president of electronic banking for Huntington National Bank in Columbus, Ohio. "First we opened branch offices and drive-in windows. Then, when we started installing Automated Teller Machines (ATMs), we became more concerned with cost-effectiveness. That's where home banking fits in. It's an alternative way to deliver banking services, and we think it's going to be important to people who own computers." One of the first banks to offer video banking with its "BancShare" program in 1982, Huntington National now has home banking customers in 26 states and Canada, BancShare offers an online demonstration and enrollment option to CompuServe users; simply log on and type GO HNB1.

WHO ARE THE CUSTOMERS?

Home banking customers pay from \$5 to \$12 for basic service, and use the service an average of once a day, according to one bank survey. Not surprisingly, they also tend to be active computer users in general. "You don't go out and buy a computer just for home banking," says Tom Havstad of Sebastapol, California, who uses an Apple IIe and Omware's Master Builder program in his general contracting business. "But once you've got the computer,

continued on next page

it's worth looking at home banking." Havstad was impressed enough with Bank of America's HomeBanking to buy a modem just for that purpose. Between his construction business and several units of rental housing, Havstad has several checking accounts and uses HomeBanking mainly to transfer money among them. "The construction business involves moving fair amounts of money in and out at particular times," says Havstad. "I have a money market account I can drop my construction draw into, start collecting interest, and then as I need to spend money on my business, move it into that account." Havstad reports only one limitation in Bank of America's service - the system can handle only four checking accounts at a time, and to accommodate the six business and personal accounts he and his wife use, he's had to open a second HomeBanking account in his wife's name. Nevertheless, he says, "Just the time saved transferring money by computer more than pays for the service."

For M. Brooks Jones, a New York graphic designer, computers are an essential business tool. He uses two Apple II+'s, a IIc, and Apple Graphics Tablet for print graphics, software illustration, writing and record keeping. A Citibank customer, he was intrigued by the bank's promotion of its Direct Access service - and by the bank's offer at the time of a free modem. But Jones, who has been a regular user of the service since August, gives video banking mixed reviews. "The trouble with video banking," he says, "is they still treat you like a bank." (Apparently, "user-friendly" is not yet a part of banking vocabulary.) "From their advertising, I expected all my accounts to be available online as soon as I signed up," says Jones. "But, in fact, the customer has to request and identify each account he wants access to. And there were no codes to tell you how to translate an account number as it appears on your statement to a meaningful onscreen cue like Day-to-day savings or 90-day savings." Likewise, he finds a lack of error-checking or help codes in the onscreen operations. "If you forget to turn on your modem, it takes about four minutes for the software to check and see if the connection's been made. And if it hasn't been made, the software doesn't tell you why."

Despite the fact that most video banking is designed for personal use, Jones, like Havstad, uses the service more for small business banking than home banking. "I have several kinds of accounts, mostly business-and tax-related," says Jones. "I often want to transfer funds between interest-bearing savings and business checking accounts." Probably the feature he uses most is the review of banking activity. "I like being able to see if checks have cleared. It's a great check-tracking device."

WHAT IT DOESN'T DO

However, one of the most touted options of home banking - electronic bill paying - has not yet proved useful to Jones. In most cases, the bank generates a list of several hundred possible payees: department stores, insurance companies, other banks, utilities and professional services. Customers can designate any business from the bank's list for payment, either on a regularly scheduled monthly basis, or as single installment. The bank will either transfer funds electronically, or print out and mail a check on the designated date. (Most banks still require the usual five days for payment to be credited to your payee's account, so don't count on video banking to bail you out of those last-minute car or credit card payments.) Depending on your bank, it may or may not be possible to add your own payees, be it the neighborhood dry cleaner or a private individual, to the list. So while it's easy to make mortgage payments with home banking, it may be impossible to send your landlord a rent check. In any case, electronic bill paying will not totally replace the need for conventional check writing. M. Brooks Jones also points to "the problem of jibing my electronic payments with all the checks I write myself. That makes two streams of checks to keep track of."

So, for those whose main banking activity involves simple billpaying, home banking offers little more than a new way to bounce checks. But banks are constantly enhancing their systems with features that are making video banking more useful. Citibank recently announced a new record-keeping capability for Direct Access, which allows customers to download their banking transactions directly into financial management and spreadsheet programs like VisiCalc, Lotus 1,2,3 and AppleWorks. Manufacturers Hanover's Excel includes its own Financial Calculator program - a customized version of Electronic Arts' Financial Cookbookwhich lets you plan budgets and investment strategies, track income and expenses, and otherwise manage your money. For those who use Dollars and Sense, the best-selling financial management program, both Bank of America and Citibank are distributing a new piece of software by Monogram, Moneylink, which acts as an interface between home banking sessions and Dollars and Sense. With Moneylink you can enter all bill-paying instructions offline, then automatically log on and upload those instructions to the bank. At the end of your banking session, all transactions are saved to disk for transfer to Dollars and Sense, thus eliminating the need to reenter your banking transactions. Moneylink also sorts expenses and downloads them to the appropriate Dollars and Sense account -Travel, Entertainment, Medical, and so on.

INTEGRATING OTHER SERVICES

Along with the move to integrate home banking with popular financial software, banks are adding other options to appeal to their most sophisticated customers. Many video banking services offer access to other information and investment networks like Dow Jones News/Retrieval, the Source or Compu-Serve. Bank of America and Chase Manhattan subscribers can get stock market quotes and place orders to buy or sell through the bank's online

brokerage service. (You'll have to open an account with the bank's affiliated brokerage house, and pay additional fees and commissions.) With B of A's service, stock transactions can be downloaded into most financial management programs. Recently Chase Manhattan Bank has offered a new service that allows owners of Andrew Tobias's Managing Your Money to communicate with its Spectrum home banking system. The new service permits Chase customers to use the Managing Your Money program to upload and download banking transactions and to obtain securities quotes as well as other financial advice. And for people who want to mix business and pleasure, Chase Manhattan's Spectrum diskette includes a financial management video game -InvestQuest - "where outer space and Wall Street meet."

A FEW DROPOUTS

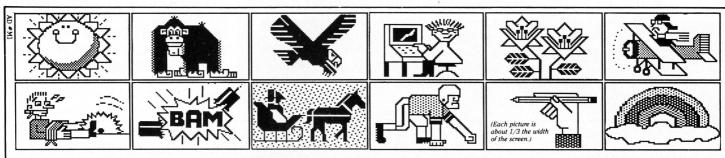
Whether home banking has a serious future remains to be seen. Even

as more banks begin to test the waters, others are dropping the experiment. After extensive market testing, Crocker National Bank of San Francisco and First Interstate Bank of Los Angeles have scrapped plans for home banking services, citing insufficient demand among bank customers. "Results were mixedgenerally good, but not overwhelming," says Crocker spokeswoman Jana Reese. "Many were not using the system to its full potential." Under a licensing agreement with Chemical Bank, Crocker would have paid for rights to use the Pronto system. Though Crocker liked the system, Reese says, "Start-up costs were high, with no immediate payback to the bank." Other banks are still deciding whether to enter the market. A network of 13 banks around the country, including Chicago's Continental Illinois, has recently concluded a pilot test of a Home Banking Interchange, and is studying the costs and benefits of the system.

HAVE ATM'S SET A STANDARD?

Observers point to the banking industry's experience with Automated Teller Machines as evidence for the long-term potential of home banking. After a slow start, ATMs have grown in number from 15,000 in 1980 to more than 50,000 machines and 120 million cardholders. "Some bankers see video banking as a way to avoid an awful lot of investment," says David Tyson, associate editor of American Banker. "The consumer himself invests in the hardware, saving the bank the cost of brick and mortar-and salaries-for another branch," says Tyson. "Obviously the bank makes an investment in software and hardware at the outset, but ultimately transaction costs will be less." Indeed, by some estimates, banks' paper handling costs can run as high as \$1.80 per transaction; electronic transactions run less than one-third that figure.

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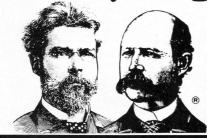
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But the 15 million computers in American homes impose their own limits on home banking. Dataquest, the San Jose research firm, estimates that less than 18 percent of U.S. households own a computer, and that only about 18 percent of those own a modem. In hopes of reaching beyond computer owners, the two leading banks in the field—Chemical Bank and Bank of America—are joining with two communications giants—AT&T and

Time, Inc.—in a joint venture. The new service, called Covidea, will offer home banking and other videotex services nationwide via a new "dumb" terminal. Equipped with keyboard, built-in modem, and standard phone jack, but lacking memory, it will sell for under \$100.

Meanwhile, as with every computer application, there's always somebody who will take to it. So far, home banking offers a new way to play with your computer—or your

money. For people managing a small business or a large number of bank accounts, home banking can be a time- and money-saving convenience. As service expands and more people buy PCs or terminals, it may change the way people bank. But until then, you can probably tell your electronic banker to start the revolution without you.//

Paul Cohen is a free-lance writer specializing in business and technology. He is former editor of Atari Connection magazine.

You Can Bank on It

At least four dozen banks around the country offer home banking, whether on national computer networks or local videotex services. While systems vary, there is one common denominator—before you can take advantage of electronic bill paying and fund transfers, you'll have to open an account at a bank offering the service. Usually the banks send out the forms necessary to open an account along with their home banking enrollment kits; account deposits can be made through the mail. Remember that

in addition to the home banking service charge, each bank has its own fees or other requirements to maintain your account. But many banks offer incentives to new home banking customers. For instance, Citibank is offering new customers two months of free service and \$25 of free time on Dow Jones News/Retrieval. Manufacturers Hanover is offering three months' free service, plus your choice of a free modem, free time on CompuServe, the Source or Dow Jones; hardware and software discounts; or \$75 cash credited to your

account. Also, Manufacturers Hanover and Chase Manhattan will send demonstration disks to prospective customers. And, if you subscribe to a service outside your local area, you will still need a local bank account for that non-electronic commodity: cash.

The chart below compares selected features of some major home banking systems; phone numbers are for service information. Except as noted, all services are available throughout the U.S.

	Cost of Basic Service	Optional Services Available	Expandable Payee List?	Hours of Service
Bank of America HomeBanking 800-792-0808	\$8/mo.	Stockline brokerage; Moneylink interface	No	6 A.MMidnight (Pacific Standard)
Chase Manhattan Spectrum 800-552-7766, or (212) 223-7794	\$5/mo.	Financial Planner software; Investment Information; Video Broker Service; Portfolio Management; Andrew Tobias's Managing Your Money	Yes	24 hrs.
Chemical Bank Pronto 800-782-1100, or 800-832-4100	\$12/mo.	Small Business Banking	Yes ¹	24 hrs.
Citibank Direct Access 800-248-4472	\$10/mo.	Dow Jones News/Retrieval; Moneylink interface	Yes	6 A.M2 A.M. (Eastern Standard)
Huntington Bank BancShare (216) 344-6303	\$4/mo.+ CompuServe connect time	CompuServe	Yes ²	24 hrs.
Manufacturers Hanover Excel* 800-MHT-BANK	\$12/mo., or \$100/yr.	Financial Calculator program	Yes ³	24 hrs.

FOOTNOTES

^{*}Serves Eastern Seaboard from Washington, D.C. to New England, excluding Maine.

¹Excludes payments to individuals with no business affiliation to customer

²Excludes payments to individuals and insurance companies

³Excludes payments to individuals. Payments to additional businesses subject to bank approval.

High Tech Help from Charles Schwab

Interviewed by EDWARD G. BEDDOW

Charles Schwab took advantage of deregulation of the securities industry to build America's most successful discount brokerage firm, Charles Schwab and Co., which became a subsidiary of the Bank of America in 1983. The company also offers a software program, The Equalizer, for the Apple II computers (see review on page 73). II Computing asked a private investment manager, Edward G. Beddow, to interview Schwab for the benefit of our readers.

customers; they just can't believe how fast we do things.

We have spent millions of dollars, literally. We have in place now IBM's largest commercial computer, the 3090 series—very expensive equipment. We have 92 offices hooked in, so we have this kind of computer power available to our customers at all times.

Beddow: In the ten years since fixed commissions were abolished, your firm has become the leading discount broker in the country. What distinguishes your firm from other brokers, and how should an investor go about selecting a discount broker?

Schwab: The most distinguishing thing about our company has been our commitment to the efficiency of the transaction—the high-tech computerization of front office and back office operations. The customer of Schwab can call in for information 24 hours a day, seven days a week. That's always available to him—his money balance is available, his buying power, those kinds of things. Then he can put orders in, execute them at incredible speeds, and we get back to him with reports on his executions.

All that used to be paper-based, with teletype machines. You can still go into many back offices and see paper, tickets written up, time delays, confusion, filing. But all that can be done by computers now. We introduced the high-tech world to investing, and the result for our customers is high efficiency. It's somewhat transparent to our



I guess we think our combination of financial strength and security, so to speak, being a subsidiary of the Bank of America, adds a whole level of financial strength that people look for. Our pricing is very attractive vis-a-vis the full-commission

continued on next page

HOTOGRAPHY ERIK WEBER

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firms, the Merrill Lynches and the Dean Witters of the world, so there's financial stength, price and efficiency that I think are really the key factors.

And there's one other important aspect; it goes two ways, however. One is that the Charles Schwab organization does not provide investment advice. We do not tell a person that they should buy stock A over stock B. So we really appeal to people who want to control their own investments, their own financial destiny, and not be reliant or dependent on some salesman at a standard or full-commission firm. That's the way I set up the company originally. They can go to investment advisors, to publications, they can do their homework, they can use The Equalizer to get into the databases such as Standard and Poor's, or Value Line or many others. But Schwab is set up to be a very efficient transactor of stock market equities, or bonds, money markets, those kinds of things.

- **B:** Is it necessary for a person to be experienced in finance or the stock market in order to take advantage of using a discount broker?
- S: My personal opinion is that anybody can get involved in the stock market with almost no experience, if they're willing to spend a little bit of time. It doesn't take too much time. In the book I wrote about how to become your own stock broker, I described how to get started in investing, how I introduced my oldest son to investing. I think you've got to do that early on and encourage your children to get into investing, not with large amounts, but just to get the experience, to get their feet wet. You can start doing it with five hundred dollars, and what I'd advise people to do at the very beginning is to buy no-load funds. You get diversification of your investment, you get professional management, and it just happens that Schwab does offer a full line of no-load funds. As they become more sophisticated, more worldly about financial affairs—well, maybe they never do, maybe they use no-loads all their life (I do still) then, they can begin picking individual securities for their portfolio.

There are a lot of ways to find a good investment. Things like Apple. It was obvious in the early days that Apple was growing like crazy. Take the early days of McDonald's. Kids were saying, "Dad, take me down to McDonald's for a hamburger." You said, "What, a 24-cent hamburger?" All of a sudden you see they're flourishing. There are lots of obvious situations like that. But you have to tune your ear: it's a sensitivity you have to pick up over the few years when you first begin thinking about it.

B: Let's take the case of a novice who has made some terrible investments at one time and is hesitant to get back in. How should that person approach investing?

S: Well, it's not an uncomplicated thing. It's my belief that right now, for instance—between now and the next three or four months—the market will become much more exuberant and buoyant, and we'll have a whole new wave of investors coming into the stock market. They'll be reading about it in the Wall Street Journal, and what happens is that the market moves in cyclical patterns—as we know—bull and bear cycles, bull being the up cycles and bear being the down, and that most investors come in the top parts of markets. They leave at the bottoms, and very few new investors come on in the low parts of the markets. It's the usual phenomenon, and you've got to be aware of these market motions.

If you aren't able to understand your personal emotions, you'll never be successful in the stock market. You've got to understand when you are exercising greed, and when you are clearly in a fear mode. If you understand that about yourselfif you know when you are in a greed mode — then you have to be able to step back and say to yourself, look, I shouldn't be leveraging up; I shouldn't be borrowing to the hilt. When everybody around you is making money, that's the time to back away. The other time to watch for is when everybody is saying, hey, the stock market is the worst place to be. When everybody is going bankrupt, that's the time when the little light goes on and you say, hey, I'm really scared, so maybe this is the time when I should wade into the water a little bit and...

So, anyway, I talk about that in my book. Twenty-five and some years of investing, and I've made every major mistake you could possibly think of. But I've also made some successes. So, it's doable: I've done it.

- **B:** Do you make a distinction between traders and investors, and is that something which is important for beginners to understand?
- **S:** It gets very foggy. People will come into the stock market during buoyant periods and become traders. Of course, stockbrokers love to have traders. They make a few points here and a few points there, and then all of a sudden the market goes down, and traders become long-term investors. They hold on to their losers, they go down, they're not going to sell off their losses. Traders become investors in down markets, and there are other people who continue trading when they really shouldn't, because

advise people at the very beginning to buy no-load funds.

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they don't understand their own emotional makeup. It's crucial to understand yourself in this business.

B: A couple of years ago you began to offer mutual funds to your customers. What other novel products do you have planned?

S: We are committed to the whole area of information. How can we get investor type information . . . let me back up. We spent a lot of time in the earlier years using technology to make us and our firm more efficient. Now we think there is an opportunity to use technology to get information into the hands of our customers to make them more informed investors, more organized, and all those kind of things. We want to make their investing more efficient and convenient.

We have The Equalizer, a beginning thrust into allowing people to use things like the power of personal computers and the databases that are available. Maybe it is like our "Model T" at this beginning time, but we have to step into the water someplace. We think that's going to expand and flourish, and many people find it very powerful even at this moment in time. We have a new set, like the Schwab Line, which is a tailored smart telephone that gives you a printout of your portfolio's valuation and today's news headlines and news about the companies in your portfolio. At the end of this year we're going to offer a very sophisticated system on buying bank CDs. So investors will be able to come to Schwab, and say, "I want \$20,000 worth of the Bank of Texas, or the Bank of South Dakota," or whoever is paying the highest rates in the country right now for insured stuff, and we think that will be a real nifty deal.

And the IRA is an enormously growing thing that is becoming bigger and bigger. Every investor should have an IRA. It's just one of the great gifts of the U.S. government.

B: Did you mention Schwab Quotes?

S: No, I didn't. We have in beta testing now maybe a thousand customers who are using Schwab Quotes. It's a telephone-based system where you're talking to a computer chip, essentially, that is programmed for voice. You punch up a number and it gives you a computer voice back with quotes on stocks, and if there's news that affects that stock today, it will tie you in with the Dow phone line to give you the news related to that particular company.

B: How successful has the Equalizer software been?

S: Well, it is probably suffering some of the same reluctance that the whole computer field has felt in the last year or so. Its appeal is to a limited set of people. First, they must have little or no fear of using a personal computer. Second, they've got to be an investor—or at least considering being an investor—so the combination of factors really cuts down on the size of our market. We also have a difficult time explaining the power of it through the written word. The only way we really can do it is to have it in a demonstrated setting so someone can really see what happens there. It's difficult to show people in a straight black-and-white newspaper ad.

B: Do you offer a demonstration disk?

S: We do have a demo disk available, but I'm not really sure that does as good a job as I'd like to see. We could improve on that, make it more visual. But the key is our offer to the customer of a free 30-day trial. In addition to offering all these services from Market Scope to Dow Jones News for a month at no charge, we give a full, 100 percent refund if someone's not satisfied with the product after 30 days.

B: The financial markets have become dominated by institutional investors while the small investor has remained on the sidelines. Is your software package something that gives the small investors an advantage or at least provides them with the same quality of information as the institutional investors have?

S: Well, this was one of our hopes, that by using The Equalizer they'd have better management of portfolios, quicker ways of executing, and quicker access to the information available.

One of the things about individual investing that we've found over the years is that the big institutions can buy into the major Fortune 500 companies, the Fortune 1000 companies. But the beauty of the individual investor is that if they take the time, they can get into the smaller companies—there are another 3,600 companies that are traded on the exchanges, usually smaller companies that may be associated with more rapid growth—and that's really where they have the advantage. These companies have thinner capitalizations, however, but that's where you get the opportunity, the possibility for a much higher growth rate.

Look at Apple itself. In the early days it was first a \$50 million-a-year company, then a \$100 million a year company, then a \$200. They had an enormous, almost geometric growth rate. Now as

continued on next page

he IRA is one of the great gifts of the U.S. government.

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it gets to size, it's hard to maintain that kind of growth. But what the individual investor can do is find the smaller companies that are growing at geometric rates, and that's where you're going to get much higher rates of capital appreciation. Big institutions cannot do that, they simply have to stick to the big fish.

The Equalizer and other electronic programs are starting to bridge the information gap between the professional and the individual. The Equalizer program with Market Scope updates you every fifteen minutes as to what stocks are moving and why, merger rumors, and so forth. Analysts know that when stocks move, they're commenting on what's happening with the market leaders. And the recommendations that it's making are updated on any news, so you're getting it just as fast as would any professional investor.

- **B:** I'd like to go back to something you mentioned about IRA's and how important they are for individuals. You've really been a major factor in opening new IRA accounts at your firm. How would you suggest people go about choosing a financial institution to hold their IRA?
- S: There are several things. Certainly you want to deal with a firm that is secure in the sense that your accounts are protected by large resources of the company itself and that they are insured—in our case by SIPC (Securities Investors Protection Corp.). The investment return is not guaranteed, but your money will be there whenever you want it – over the long term. That's clearly quite important. Secondly, you want to deal with a firm, I think, that has the flexibility of investments. You don't want simply to get a bank deposit and that's all you can do. Maybe you want to buy IBM, or growth stock, or Apple, or some other investment. You need flexibility without large fees to diversify into some other kinds of investments. Thirdly, you'd want a firm that's very cost efficient. In our case, with Schwab, we charge no fees for an IRA. The way we make a return is that we charge our discounted commissions when someone buys a stock or mutual fund.

Another thing that's important to stress is that each individual investor should have a self-directed IRA where he can control his investments as his situation changes, and not have to go through rollovers and transfers and so forth.

Our goal is that you're not locked into a given investment. At Schwab you can have a money market fund today, and tomorrow if you change your mind and you want Apple, you buy Apple. Or you might want a mutual fund involved with foreign securities. You can do that, or you can buy a CD,

or a Ginnie Mae, or a government security. You're not locked into anything at any time. You can change your mind.

There's another aspect of IRAs that few people talk about, and that is—what happens when the payout comes? Most firms are interested in getting money in, but they don't realize how complicated it is to make the proper distribution at retirement. So as a characteristic, you want a firm that has a built-in infrastructure, systems that will be able to handle your withdrawal, that won't be goofing around at the time you want your money, and not get you the proper payout.

- **B:** Let's turn to the world of investments. Where do you think the market is headed over the next twelve to eighteen months?
- **S:** We're entering into the second phase of this powerful bull market right now. It's been going on for several years, and I'm confident it will continue over the next three to four months. I think there will be a lot of new issues.

My view is not out 18 months. I'm sanguine about the next four to six months. I've been an extremely aggressive bull the last couple of years, and I think there has been a continuation, but I'd like you to ask me that question again in about four months.

- **B:** Is there anything else you'd like to talk about that we haven't covered?
- **S:** I would simply like to refer your readers to this book (*How to be Your Own Stockbroker*, by Charles Schwab, Macmillan). I mean particularly new investors. What you've got in there is very important. You've got to know where you are in your life cycle, where you take degrees of risk in investing, you've got to understand your emotions—I think that's crucial to investing. And if you conclude that you can't handle it yourself, then you should find a very trusted person, or several, who can give you assistance along the way.

I'm always concerned about—well, I know there are some very fine stockbrockers, and I don't want to talk down to my brethren in the business—but you've simply got to understand that when you are dealing with a traditional broker, you've got to know his vested interests. What usually happens is that the higher the risk a security is for a new investor, the higher the reward is for that particular broker. If you know that going in, it'll be a satisfactory relationship. If you don't, if you go out there willynilly and get sold some crazy tax shelter and lose all your money, understand that he gets a higher level of compensation for selling that than something that is safer.//

introduced the high-tech world to investing.

is an independent, registered investment adviser in San Francisco. His firm manages the investment of pension fund money for individual clients as well as for company retirement plans.

Five Online Financial Services

by ANN GARRISON

nline financial services can give you quick price quotes, investment information and portfolio management assistance. Do, however, read brochures from several services before choosing one.

Most of these services offer financial information databases which give you such items as: corporate profiles, price/earnings ratios, moving averages, trading volume and so on. For example, Compu-Serve offers Value Line Database II and Standard and Poor's Summary Reports. These databases will vary from service to service.

Costs depend not only on the service chosen, but also on baud rate, databases used and when you use them. The comparisons here are general because no two services are structured in the same way.

All of the following services are menu and command driven and easy to learn. All have help menus and/or tutorials, and toll-free customer service numbers.//

Ann Garrison is a free-lance writer in San Francisco. She has done research for the Fine Arts Museums of San Francisco, and uses electronic databases in her work.

Name of Company	CompuServe Executive Information Service	Dow Jones News/Retrieval	Quotron Quotdial	The Source (Investor's Services)	Vestor (Investment Technologies, Inc.)
Address & Phone	5000 Arlington Ctr Blvd P.O. Box 20212 Columbus, OH 43220 800-848-8990 (contiguous U.S.); in Ohio, (614) 457-8650	P.O. Box 300 Princeton, NJ 08540 800-832-1234	5454 Beethoven St. P.O. Box 66914 Los Angeles, CA 90066 800-624-9522; in CA, (213) 827-4600	1616 Anderson Rd. McLean, VA 22102 800-336-3366; in VA and outside U.S. (703) 821-6666	Metropark/ 510 Thornall St. Edison, NJ 08837 800-524-0831; in NJ, (201) 494-1200
Price Quotations	Bonds Commodities Options Stocks (Daily: 15-min. delay; instant quotes \$35. Historical: 1973-present)	Bonds Commodities Options Stocks (Daily: 15-min. delay; instant quotes \$18.50/mo. Historical: 1978-present)	Bonds Commodities Options Stocks (Daily: market closing)	Bonds Commodities Options Stocks (Current: 15- min. delay; instant quotes \$20/mo)	Commodities Options Stocks (Daily, market closing)
Reports	Company SEC News Financial analysts	Company SEC News Financial analysts	Company News Financial analysts	Company News Financial analysts	Investment advisory (mathematically generated by Vestor)
Financial Information Databases*	20	14	19	12	None
Buy & Sell Online	Through three discount brokerages—Max Ule, Inc., Quick and Reilly, or Unified Management Corp.	No	No	24 hours a day through discount brokerage, Spears Securities	Through discount brokerage, Fidelity Services
Costs*	Subscription: \$49.95 (one-time), \$10 monthly minimum. Hourly rate: \$6-22.50. Additional charges for specific programs and databases.	Subscription: \$75 (one-time), \$12/yr. Per minute rate: 20¢-90¢. Additional charges for specific programs and databases.	Subscription: \$50 (one-time); Hourly rates: \$10-30; Addi- tional charges for specific programs and databases.	Subscription: \$49.95 (one-time), \$10 monthly minimum. Per minute rates: 14¢-46¢. Additional charge for selected information databases.	\$295 (one time), \$24 monthly minimum. No hourly cost. Additional charges for specific programs.

^{*}Online time costs and program and database charges go towards monthly minimums.

FEBRUARY / MARCH 1986

ADVANCED COMPUTER CONCEPTS

Cellular Automata

by DANIEL WOLF, Ph.D.



Daniel Wolf is a scientist who likes to use microcomputers to explore mathematics and scientific concepts. A musician as well, Dr. Wolf has an academic background in biology, physics and math.

Fans of Martin Gardner's "Mathematical Games" column in *Scientific American* may recall John Conway's "The Game of Life," which Gardner introduced to his readers in the early 1970s. Since then, thousands of people—especially those with access to computers—have avidly explored the game's possibilities.

The "life" in question is that of a "cell," or cluster of cells, each of which survives, dies or is born according to a set of simple rules. Picture an infinite two-dimensional grid as the "world" where these cells exist (see Figure 1). Each four-sided cell can be alive (filled in) or dead (empty), but in the beginning all are dead and the grid is empty.

To start the game, the player gives life to one or more cells by filling them in. Each square cell has eight neighboring cells, one on each side and one at each corner. Each neighbor cell is either alive or dead.

The player can adjust the rules of life and death for the cells, but most people play with the rules discovered by Conway. They are as follows:

- **1. Survival.** A live cell survives to the next generation if it it has two or three live neighbors, but otherwise it dies.
- **2. Death.** A live cell with four or more live neighbors dies from overpopulation. A live cell with one or no live neighbors dies from isolation.
- **3. Birth.** An empty cell adjacent to three live neighbors is a birth cell, and becomes alive in the next generation.

A "generation" occurs each time the rules have been applied to all the cells involved. For example, a single live cell always dies after the first generation, because it has no neighbors. Two adjacent cells are likewise short-lived. Three live cells in some configurations can survive, and the first stable cluster is the four-cell square. In this case, each cell is immortal (and immutable) since it has three neighbors. The fun really starts with clusters of five or more cells, and some groups have been tracked for hundreds of generations that reveal complicated and unexpected graphic developments. If you're interested, the game is described in Martin Gardner's book, Wheels, Life and Other Mathematical Amusements, W.H. Freeman and Company, copyright 1983, from which Figure 1 was taken. The game is also featured on Golden Oldies, a disk recently issued by Electronic Arts for the Apple II.

Cells have their own intelligence, that's what make them interesting.

Life is a special case of a more general concept. Cellular automata are arrays of points, with each cell a variable that has a value. In Life, the cells can be represented by values of 0 or 1. They are equipped with their own intelligence—in the form of the rules they follow—and that's what makes them so interesting. The cells are arrayed in a grid on a plane but can also be arrayed on a line or one-dimensional grid. Such lines will be the subjects of our first experiments.

By giving each point its own intelligence, you can make the line of cells do things. You can assign any kind of intelligence you like to cells, but don't be too ambitious at first. For now, each cell may have values of only 0 or 1 and be able to sense the value of only its two immediate neighbors. Now give each cell its own simple computer. With a computer and the ability to sense its neighbors, each cell is able to change its value according to some

ADVANCED COMPUTER CONCEPTS

program that corresponds to its environment. Try programming the cellular computer this way:

- 1. If the cell's value is 0:
 - a. If both neighbors are 1's, make the cell a 1.
 - b. If both neighbors are 0's, make the cell a 1.
- 2. If the cell's value is 1:
 - a. If both neighbors are 1's, make the cell a 0.
 - b. If both neighbors are 0's, make the cell a 0.

That's a pretty simple program, but you have now created a linear cellular automaton, defining the sensing capability and program for each cell. These cells look at their neighbors and reverse themselves if both neighbors are identical. Now see what happens when you turn the cells loose with these abilities.

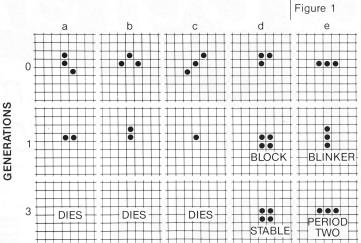
Enter the AUTOMATA program listed on page 56 (or boot from the Action Disk), and choose the LINECELL subprogram (Option 1 of the BASIC Program). This is a graphic implementation of the cellular automaton. Using the Apple's text display, the line of cells is shown as 40 characters on a screen line. LINECELL displays an asterisk to represent a cell with a value of 1, and a blank space where a cell has a value of 0. The program maintains two 42-element arrays (**n** and **o**) to represent the values of the cells. In each array, the end cells are permanently set to 0.

When you begin, LINECELL asks you to enter a string of 1's and 0's to give each cell a starting value. Then LINECELL has each cell look at its neighbors, compute a new value for itself, place the new value in the second array, and also display it. (If you put the new values into the array containing the old values of other cells, the new values of some cells would interact with old values of others.) After the cells run their program, LINECELL moves the new values into the old array. LINECELL will ask you to press a key after showing 20 generations. The array of 40 points is like having 40 computers in parallel. LINECELL doesn't have the ability to run all 40 at once; it lets each cell run in turn (that's why it has two arrays). It simulates the 40 parallel cellular computers.

I encourage you to try LINECELL using all 0's or all 1's as your set of initial values. Now you can see what is meant by "evolution" in a cellular array. The pattern of asterisks and blanks evolves with each generation of the 40 cells. Will it repeat itself? Can you imagine what the 5000th generation will look like?

Once you have the general idea of cellular computation, you can explore deeper. The cells can

be given more than two states and can be endowed with more complicated sensing and computing abilities. You can design sensing of distant neighbors, more complex value change programs, and more. You can give even-numbered cells different abilities than the odd ones. You can make a systematic exploration of linear automata, using the indexing or naming scheme outlined by Stephan Wolfram (*Scientific American*, Sept. 1984).



THE FATE OF FIVE TRIPLETS IN "LIFE"

Among the mathematical giants of this century are the distinguished computer scientists John von Neumann and Stanislav Ulam. Cellular automata interested them keenly, and they proved some deep mathematical theorems in this field. In future issues I will follow their lead, having cellular automata express themselves in more complex and more graphically interesting ways. I'll discuss two-dimensional automata, including Life and others. Until then, I'll leave you with the following items to play with and consider:

- 1. LINECELL5 (Option 2 of the AUTOMATA program) is a linear automaton with five values for each cell. Think of the graphic possibilities.
- 2. Von Neumann discovered a cellular automaton system with very complex cells (hundreds of possible values for each cell) that could reproduce itself.//

PRODUCT INFORMATION

GOLDEN OLDIES Electronic Arts 2755 Campus Drive San Mateo, CA 94403 (415) 571-7171 64K; \$34.95

Listing on page 56

27

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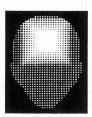
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TALES FROM THE CRYPT

More Tools For Deciphering

by CAXTON C. FOSTER

This column is about using your computer to solve ciphered messages. Each installment builds on material previously presented, so first-time readers may be confused by some terminology and concepts. If you want the full series of these articles, start with Vol. 1, No. 1, of II Computing, or get Dr. Foster's book Cryptanalysis for Microcomputers (Hayden), which parallels much of this material.

In substitution ciphers, as you recall, the letters in the plaintext are not moved around, or scrambled, to make a ciphertext. Instead, the letters keep their plaintext positions, but each plaintext letter is systematically substituted for by some other letter, for example, x for a, y for b, z for c, etc.

If the ciphertext retains the interword spacing and punctuation of the plaintext, it is called an *aristocrat*. If spacing and punctuation are deleted, the cipher is called a *patristocrat*, obviously a more difficult cipher to crack.

In the simple substitution cipher each plaintext letter is replaced by a single ciphertext letter. This means we can construct a pair of alphabets: one alphabet is the plaintext letters (abcd...etc.), and a second is their substitutes in the ciphertext. For example, the alphabets might look like this:

abcdefghijklmnopqrstuvwxyz XYZABCDEFGHIJKLMNOPQRSTUVW

Note that the plaintext is written in lower case and the ciphertext in caps, a convention usually observed in cipher work. Using these alphabets to encipher a message, we might start:

now is the time for ... KLT FP QEB QFJB CLO ...

The general method of attack to solve an aristocrat includes the following:

1. Common letters will appear frequently in a message, but don't expect exact correspondence between

frequency in the message and frequency in the language.

- 2. Start working with the shorter words first, since there are fewer possibilities to explore.
- 3. Look for common endings such as -tion, -ing, -ers, -ent, -ant, -ted, -ess, -red, -nce, and so on.
- 4. Guess a lot. Your brain is a very powerful computer, and it has registered hundreds of thousands of words.
- 5. If there are only a few possibilities, try them in turn.
- 6. Every word has to have at least one vowel and usually has one or more consonants.
- 7. Keep looking for a coherent message. The crypt is supposed to make sense.
- 8. Do something! Even if it's wrong, it's better than staring at the page.
- 9. Do lots of ciphers. That will improve your intuition.
- 10. In a message of 100 letters, about 40 will be vowels.

Last issue we began to build a tool kit for solving substitution ciphers. In this kit was a table of letter frequencies for the English language. This time you get a table of *digram* frequencies. A digram is a two-letter pair. Some pairs are frequent, some are rare. TH occurs a lot, QZ only rarely, if at all. Figure 1 shows the frequency of digrams for English words, ignoring those that cross word boundaries.

In Figure 1 you discover that the letter O is followed by N 165 times per 10,000 digrams, and that continued on next page



Caxton C. Foster, a Ph.D. in electrical engineering, was a computer science professor at University of Massachusetts. Presently he is a consultant to Mount Castor Industries of E. Orleans, MA. which designs computer programs for school administrative use. Dr. Foster is the author of five books and numerous technical articles.

TALES FROM THE CRYPT

T is followed by H 361 times. The most popular digrams are contained in the mnemonic sentence: AND THERE IT IS, AL, SITTING IN A TON OF ORE. Consider only the within-word digrams, and ignore the TT of sitting. The obvious thing to do is to expand your letter-frequency subroutine to count digrams as well. That's challenge number one this time.

Unfortunately, in a 100-letter crypt, any digram that appears more than once is a frequent digram. Look for reversals, such as ER and RE, or IT and TI. If you have a popular digram, look at the frequencies of its constituent letters. For example, TH is a frequent digram, T is a very popular letter, and H is of only middling frequency. If your candidates show that pattern, you have a definite maybe.

A third trick is to try to separate the vowels from the consonants. One of the better methods of doing this is called the *consonant line*. It relies on the fact that vowels tend to adjoin consonants and vice versa. Letters that contact lots of different letters are probably vowels, and letters with only a small circle of friends are probably consonants. I'll show you how to do the consonant line by hand. Challenge number two is for you to computerize the process.

For each letter of the ciphertext, note down the letters that precede it and the letters that follow

it. Using an asterisk for a blank space, write down all the triples containing A, then all the triples containing B, and so on.

We have done this below for the text:

A FOOL	AND HIS	MONEY	ARE SOON	PARTED
A	NEY	OL*	OOL	ART
AN	RE	*MO	MON	IS*
*AR	TED	AND	SOO	*SO
PAR	*FO	ONE	OON	RTE
ND*	*HI	ON*	*PA	EY*
ED*	HIS	FOO	ARE	

Now, count the number of different letters each letter contacts:

A=3	l=2	P=1
D=2	L=1	R=3
E=5	M=1	S=2
F=1	N = 4	T=2
H=1	O=7	Y=1

The third step is to divide the letters into two groups, in the following way. On scratch paper, draw a large T. Across the top of the T write the letters that have only one contact (in our example: the letters FHLMPY). These are the tentative consonants. Of course, we are working with plaintext and can see that they are consonants, except for Y; but in ciphertext they could be any letter.

Figure 1 (Occurrences per 10,000 Digrams)

Second letter of digram

	Α	В	С	D	Е	F	G	Н		J	K	L	M	N	0	Р	Q	R	S	Т	U	٧	W	Χ	Υ	Z	
Α	0	22	44	44	1	7	20	1	36	1	12	100	27	196	1	18	0	107	94	143	11	21	7	2	26	2] A
В	17	2	0	0	60	0	0	0	10	2	0	24	0	0	22	0	0	11	4	1	22	1	0	0	16	0	В
С	51	. 0	7	0	61	0	0	58	24	0	17	15	0	0	75	0	0	14	2	38	13	0	0	0	3	0	С
D	16	0	0	5	74	0	3	0	45	1	0	4	2	3	21	0	0	10	13	0	12	2	1	0	6	0	D
Е	73	2	42	126	42	15	11	2	17	0	3	54	36	140	6	17	4	204	124	43	2	26	13	19	17	1	E
F	17	0	0	0	23	14	0	0	28	0	0	7	0	0	50	0	0	21	0	8	10	0	0	0	1	0	F
G	15	0	0	0	37	0	3	27	15	0	0	6	1	6	15	0	0	20	5	2	8	0	0	0	2	0	G
Н	101	1	0	0	330	0	0	0	87	0	0	1	- 1	3	53	0	0	9	2	16	8	0	1	0	5	0	H
	23	9	65	34	36	19	27	0	0	0	6	47	34	240	69	9	1	32	111	111	1	26	0	2	0	6	1
J	3	0	0	0	4	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0	7	0	0	0	0	0	J
K	2	0	0	0	28	0	0	0	11	0	0	- 1	0	6	1	0	0	0	5	0	0	0	0	0	1	0	K
L	50	1	1	31	86	6	1	0	62	0	3	64	. 3	1	39	2	0	1	13	11	13	3	1	0	47	0	L
M	56	9	0	0	80	0	0	0	32	0	0	0	9	1	35	21	0	4	10	0	13	0	0	0	6	0	M
N	30	0	38	131	74	5	103	1	34	1	6	7	2	10	46	1	1	1	48	101	8	4	1	0	11	0	N
0	8	10	15	19	5	106	8	2	9	1	8	36	55	165	28	22	0	124	29	43	98	19	36	1	4	1	0
Р	30	0	0	0	47	0	0	8	14	0	0	26	2	0	33	14	0	41	5	8	10	0	0	0	1	0	P
Q	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13	0	0	0	0	0	Q
R	63	3	10	19	180	3	9	2	67	0	10	10	16	17	73	4	0	11	44	35	13	6	1	0	23	0	R
S	24	1	14	1	86	1	0	36	53	0	5	7	7	2	39	19	1	0	39	111	28	0	3	0	5	0	S
Т	51	0	4		116	1		361	116	0	0	12	3	1	110	0	0	39	34	20	23	0	8	0	20	0	T
U	12	9	17	9	13	2	15	0	10	0	0	35	13	42	1	15	0	51	45	44	0	0	0	0	1	0	U
٧	12	0	0	0	82	0	0	0	24	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0	1	0	٧
W	50	0	0	1	38	0	0	40	40	0	0	1	0	10	25	0	0	3	32	1	0	0	0	0	0	0	W
Х	2	0	2	0	2	0	0	0	3	0	0	0	0	0	0	7	0	0	0	4	0	0	0	0	0	0	X
Υ	2	1	1	1	12	0	0	0	3	0	0	1	2	1	17	2	0	1	11	2	0	0	1	0	0	0	Y
Z	2	0	0	0	5	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	Z
	Α	В	С	D	Е	F	G	Н	1	J	K	L	M	N	0	Р	Q	R	S	Т	U	٧	W	Х	Υ	Z	

First Letter of Digram

TALES FROM THE CRYPT

We will now write the tentative vowels on either side of the stem of the T—to the left of the stem if the tentative vowel preceded the tentative consonant, and to the right of the stem if it followed the tentative consonant.

FHL	MPY	
0	00 I A	
E		

Now proceed to letters with two contacts, then three, and so on. If at any time you come to a letter that is already on the chart, disregard it. Finishing up for the above message, you get:

F	HLN	MPYDT	
eta irralio dose	0	00	
	ΞE	A	
narchiblese win a	N	allo recessor to the	
	R		

This is a very short message, with only 29 letters, but already you can see the pattern developing. It isn't perfect (Alas! What is?), but it is doing fairly well. In the last analysis, you look for letters that appear on both sides of the stem, such as O and E in our example; these are probably vowels.

If you have lots of spare time, you can consider the following method of separating vowels and consonants. Draw two circles, known as group one and group two. Take the most popular letter of the crypt and put it in group one. Identify the letters it contacts and put them in group two. Take each letter of group two, identify the letters it contacts and put them in group one. When you've done this for all letters in group two, go back to group one and identify the neighbors of any letters there that have not yet been assigned to a group.

After all the letters are assigned to a group, take the letters one by one and count the number of letters in each group with which the subject letter has contact. Put the subject letter in the group with which it has the fewest contacts. Does this effectively separate the vowels and the consonants? Could you do better with three groups? With four?

DISCUSSION OF PROGRAM

The program, listed on page 54, includes two options. The first is a solution to the challenge presented in our last installment. It is also a convenient way to generate aristocrats, or, with one modification, to decipher them. This program is a further development of the program I gave you last time, so please see that issue for more detail of the main routine. This time I have added a

subroutine to generate a keyword-shifted alphabet.

Lines 1000—1170 get a keyword (K\$) one character at a time.

1130-1170 handle the backspace, and the keyword is terminated by a "/".

1180-1210 get the shift (S) and add one to it for convenience.

1220-1300 peel off the letters from K\$ one at a time, check to see that the letter has not been used (C%(I)=0), and save it in the ciphertext alphabet A%.

1310-1360 run through all the letters of the alphabet to find those not in the keyword and add them to the alphabet.

1370—1420 build the inverse alphabet for deciphering.

Change line 740 to decipher rather than encipher the message. The changed line should read:

740 PRINT CHR\$(D%(T));

Here are some more aristocrats for you to decipher. Again, the first person who submits the correct plaintext for all four crypts will receive a sixissue subscription to *II Computing*. Send entries to CRYPT, c/o *II Computing*, 524 Second Street, San Francisco, CA 94107.

- 1. M AU DMIIFHFVR IHXU *SAEKMVJRXV; M KAYF A KMJKFH, JHAVDFH ERAV-DAHD XI ZHMVBMZQF. KF BXYQD VXR QMF. M BAV QMF, LYR M SXV'R.
- 2. P LXRN CNJMXPDTV EDSFD BFJN BND YNKMJFVNY ZV MLN YNKPJN MF LXRN X SPIN XDY CLPTY XDY MF ENNG MLNB PD CFBIFJM MLXD P LXRN KNND YNKMJFVNY ZV YJPDE XDY LXJTFMK.
- 3. BFX BUXX SY ORTXUBL MGAB TX UXYUXAFXW YUSM BRMX BS BRMX JRBF BFX TOSSW SY PQBURSBA QIW BLUQIBA. (T. Jefferson)
- 4. REDG MED FSGSLMDK ZLBDY MED ZNDY *GRD *DGNCZGYDK, "EZQD VHP FZYD VHPK IDZAD RSME *NHY?" MED AKPLMV *VZGBDD KDICSDY," RD ZSG'M JPZKKDCCDY CZMDCV.//

The first correct response to the challenge in Issue #1 was submitted by Carol Hubert of N. Dartmouth, MA. The encrypted message was "All units must advance as rapidly as possible." She received a six-issue subscription to our Action Disk edition. Runner up was Dr. Roger Cowley of Cherry Hill, NI.

Listing on page 54

GRAPHICS

Hi-Res To Print Shop

by JON C. THOMASON

Jon Thomason is a 14-year-old computer hobbyist who uses an Apple II in his extracurricular activities. He's an honor student who enjoys programming challenges If you're like me, you use your Print Shop (Broderbund) program a lot, and you are always looking for just the right graphic to use with it. Someone told me about a product that could take any hi-res image and convert it to a Print Shop graphic. Great idea, I thought. But the price was steep, so I got to work and developed my own **Hi-Res To Print Shop** converter. My program lets you take any hi-res image you already have and load it into your Print Shop program.

The first thing I had to do was determine how much I would have to compress the original image. A Print Shop graphic takes up 52 rows by 88 columns. A hi-res image uses 192 rows by 280 columns, thus giving you a ratio of four-by-three. That means you must convert every block of nine dots in hi-res into one dot for The Print Shop. Unfortunately, that means you can only convert a section of 156 rows by 264 rows; you can't convert an entire picture. However, I've worked out this program so you can zoom into the center (or any portion) of any hi-res picture and convert that part.

How do you reduce nine dots to one? Simple. Just read the nine dots and add them up to see if enough of them are lit to be significant. Here's how to do that: there is a zero-page location called the collision counter (234 or \$EA), which stores the number of bits that were altered during a previous DRAW or XDRAW. Just XDRAW a three-by-three block over the questioned area and read the collision counter to find out how many dots are under it. Once that's done, the results go on hi-res page two. Page two has the room to store all the brightnesses for you to choose.

Now, are you wondering what this brightness means? This program can give you nine versions of the same picture, each with a different level of brightness. Certain types of pictures should be brighter than others. For instance, if you have a graph and a game title screen, you wouldn't use the same level of brightness. The graph would look best mainly black with some white, a game screen would look best mostly white or colored.

Brightness is calculated by the number of dots lit. A brightness of four would accept any group of nine hi-res dots with four or more of them lit as one Print Shop dot. If the collision counter reads less than four, the Print Shop dot is left unlit. You see, the collision counter is compared with the brightness. If the counter is greater than or equal to the brightness, the result is positive, or a lit dot. If the counter is less than the brightness, the result is negative, or an unlit dot.

Once the program scans the image, it appears in nine different shades. You choose the shade you want. Then you can make one more choice: as is or inverse. The game screen would look best as is. The graph, however, might work better in inverse. Unlit dots are printed in black. You'd want the background of the graph to be white, so the white-on-black graph should be inversed to black-on-white.

The next programming question is: How do you take the image from hi-res page two and put it into Print Shop-readable code? Again, you use the collision counter to read certain dots, but you must know the correct format. Broderbund has made that easy. Each graphic is made up of 572 (\$23C) bytes from 22528 (\$5800) to 23100 (\$5A3F), each containing eight bits. There are 11 bytes across and 52 down, read left-to-right, top-to-bottom. So, I XDRAW a single dot onto each dot and read the collision counter to get each bit in the byte. Then I put them together in binary to get a byte value to poke into The Print Shop's memory.

But, 22528 through 23100 are smack in the mid-

GRAPHICS

dle of hi-res page two, and I don't want to overwrite something I'm going to read from. So, I put them right after hi-res page two and use a move routine at line 2230 to put them where I want just before I save. There you have it, the beginnings of a graphics converter program.

HOW TO USE THIS PROGRAM

Type in the program on page tk and save it as HGR2PS. Then type RUN [RETURN] and you will be in the main menu. If you use a hi-res picture already in hi-res page one, it will be left intact.

This is not necessary, however. The main menu's option 3 is "Load screen." This allows you to load any hi-res screen you already have on disk. This option asks you the name of the screen. If your disk is in the drive and you need to run a CATA-LOG, just press [RETURN]. Once you choose a file, enter its name and press [RETURN]. You should then return to the main menu. If you choose an improper file, you will remain in option 3.

When you've returned to the main menu, choose option 1: "Reduce image." This option takes the hi-res screen one and compresses it to nine brightnesses on hi-res page two. Before it does that, however, you have to choose the portion of the screen you want to compress. A rectangular frame appears in the middle of the screen. If that's the part of the image you want reproduced, press [RETURN]. Now, move the frame around using the I, J, K, and M keys. When you've found the area you want, press [RETURN].

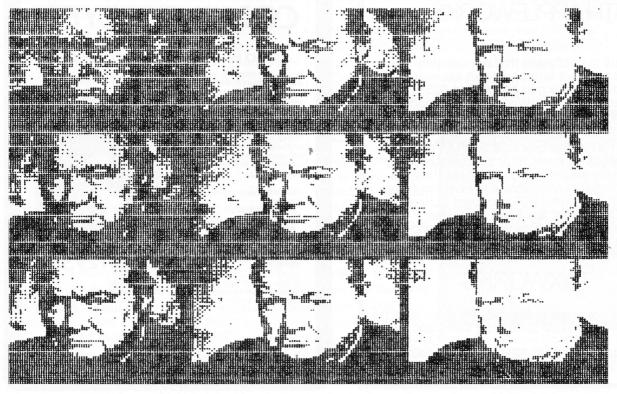
Now you can get a cup of coffee. It takes about eight minutes to compress the image. However, it's interesting to watch the images begin to appear. When this step is done, you'll be back at the main menu.

If you want to redo anything, just choose the proper step. If you're pleased with the various brightnesses, choose option two: "Save graphic." This brings you back to hi-res page two. Press the space bar to move the rectangle box from image

This program gives you nine versions of the same picture, each with a different level of brightness.

to image. Press [RETURN] to choose the image you want. The image will blink, prompting you to choose normal or inverse. Press the space bar to choose which form you want, then press [RETURN] to tell the computer to use that one. When you press [RETURN], the image will change again. Don't panic! It just does that. After about two minutes it will XDRAW itself back to the way you chose it. The program will ask you what you want to name the image; you then save it to disk and return to the main menu. Your Print Shop graphic is now on disk. You can then start over with a new image or exit the program.

Continued on next page



GRAPHICS

Now—boot up The Print Shop. Choose the "Graphic editor." Press [CONTROL G] to get a graphic. Choose "From other disk." Make sure the disk with your new graphic is in the disk drive, then enter the image's name. You can then correct details with the Graphic Editor; remember to save your work. Your graphic is ready to use. Select it the same way that you chose the Graphic Editor. Happy printing!//

PROGRAM BREAKDOWN

50-100	Initialize
1000-1130	Choose Screen Portion
1150	Set up for first scan
1160	Go through all dots
1170-1180	XDRAW block of nine and read colli-
	sion counter
1190	Plot all appropriate brightnesses
1200-1210	Restore screen and go on to next
	block
2000-2070	Determine desired brightness
2090-2140	Determine if normal or inverse image
	is required
2150	Invert final graphic
2160	Go through all dots
2170-2180	Read each bit in a byte
2190	Poke byte value above hi-res page
	two
2200	Do all bytes and set up for SAVE

Input graphic name

2220-2250	Move graphic to Print Shop standard location, then SAVE it.
3000-3040	Load image from disk
4000-4020	Exit routine
5000-5140	Title/credits/menu
COMPANY OF STREET	
6000-6070	Shape table setup and data
	LIST OF VARIABLES
X	Used in many For/Next loops
Υ	Used in many For/Next loops
XX	Horizontal starting position for
and the control of	scanning
YY	Vertical starting position for
DE MIL FILM DE	scanning
X(0-8)	Horizontal positions of the
VOV. 10	brightnesses
Y(0-8)	Vertical positions of the
in the later of th	brightnesses
A\$	Contains all keyboard input
В	Brightness number
Q	For/Next for scanning all bits in
	each byte
BIT(0-7)	Each bit to be calculated together
· · · · · · · · · · · · · · · · · · ·	as a byte
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Listing on page 65

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FOR THE FUN OF IT

Old Friends, New Friends

by NEIL SHAPIRO

As the Apple II gets older, it gets better as more programmers discover new ways to use the amazing machine's graphics and computing abilities. And, with the advent of double hi-res on the IIe, there are even more features to build upon. Even better, many of the older programs are being revamped and reworked.

FUN IN THE SNOW

The new **Winter Games** from Epyx is a tour de force combination of bright, eye-catching graphics coupled with interest-sustaining joystick skills. From the opening screen, showing a torch being lit, to the animated closing ceremonies, this disk is an exciting series of new games that are almost as much fun to watch as they are to play.

Six winter events are simulated: The Bobsled, Ski Jump, Figure Skating, Free-Style Skating, Hot Dog Aerials and Biathlon. Up to eight players can compete, under various national flags, or you can have a solitaire Olympics. Various options allow each player to compete in all the events, or just one, scored by a panel of judges; or you may practice each event just for fun, without any scoring.

The Figure Skating and Free Skating events are similar in that they use the same graphics and joystick commands. Figure Skating demands the successful execution of seven dancing-on-the-ice movements, from triple axel jumps to camel spins. To successfully execute a command, you must pay careful attention to your character's on-screen balance. It's a real riot the first time one of your skaters takes a pratfall, but it sure does get annoying when they hardly seem able to stand! But after a little play, you'll be skating like an Ice Follies princess (or prince).

Hot Dog Aerials and Ski Jumps demand similar concentration on the player's part to keep the

little animated characters from the agony of defeat or an unwelcome roll in the snow. The Biathlon and Speed Skating events will keep at least your fingers nimble as the space bar, J and K keys get a workout to keep the on-screen strides balanced and quick.

But my own favorite is The Bobsled. Frankly, this game is so good that it could have been sold on a disk by itself. The left side of the screen is filled with an overhead schematic view of the bobsled course, twisting and turning its vicious way downslope. The right-hand side of the screen features a bobsledder's-eye view of the dangerous, icy curves ahead. The only thing I wish is that Epyx had included a few more courses on the disk. The course does get a bit repetitive after your 100th time around, and my skills, at least, seem to have reached a score plateau. Still, an excellent game.

Overall, if a simulation of the Winter Olympics appeals to you, go for the gold.

SHOOTING DAGGERS

Penguin Software lets you pick up the **Sword of Kadash** and with it venture deep into animated caverns. A real-time fantasy action adventure, this is a game that has great appeal to both role-player and arcader,

but with a few flaws that take some of the polish from the blade.

An on-screen character is led via joystick through continued on next page

Neil Shapiro is editor-in-chief of MacUser Magazine and is also chief sysop of the MAUG Apple Group on CompuServe.



WINTER GAMES

FOR THE FUN OF IT

a series of mazelike rooms. Rooms contain treasure, weapons, keys and scrolls, armor and—oh, yes—monsters and traps.

By picking up various weapons and armor, the character can change to different classes of fighting ability. And, as more monsters bite the "pixelated"

dust, characters increase in experience points and become meaner and they rise in level.

Many of the

Many of the rooms are not only very good puzzles (with invisible walls and moving, knifelike obstacles to spice up the challenge), but they are done in an artistic, unique

an artistic, unique manner. The graphics are amusing, colorful and among the best I've seen in this type of game.

But, alas, there are some problems. The little on-screen warrior fires arrows via a joystick fire button. This happens even if he is supposed to be wielding a sword or a dagger. For me, this destroyed much of the game's believability. I think it would

have been better to have not included weapons that could not be fired (or to have changed some of the game's mechanics).

Also the warrior

Also, the warrior is given three lives per adventure. When he is dead for the third time, the player must make a new character disk.

Even with two drives, it takes as long to make this character disk as it would to copy any disk. With a one-drive system, and the attendant disk-swapping, this can make the game terribly slow. One way around this problem is to just sit down one day and make up five or six character disks

ahead of time.

Yet, though these two problems are not minor ones, I found that Sword of Kadash is fun to play on its own terms.

NEW FANTASY LANDS

Windham Classics' new line of software is based around titles such as *Alice in Wonderland, Treasure Island, Wizard of Oz,* and *Swiss Family Robinson*. Obvi-

ously, these are familiar titles and probably they include at least one or two names that spark a bit of happy remembrance in all of us. In a way it was a risk for Windham to bring such beloved books into the computer age. Had the company not captured the flavor of these books the result could have been disastrous.

Well, Windham's done an excellent job. The games are split into two styles of play. The first style (to which **Treasure Island**, **Swiss Family Robinson** and **Wizard of Oz** belong) is the more or less standard illustrated adventure game. The second style (for **Alice in Wonderland** and a game based on the new but already extremely popular *Below The Root* trilogy) mixes adventure with the arcade.

Playing Alice in Wonderland really does recall the madcap but logical antics with which author Lewis Carroll has enchanted generations. Alice, who looks very much as Tenniel pictured her, must be moved through room after room and encounter after encounter. She can talk to characters, scold them and tease them, as well as simply ask questions and pick up objects. All the commands are chosen by joystick from an on-screen menu.

As Alice meets the White Rabbit, the Queen of Hearts and other characters, she must find various objects, from marmalade to keys. These objects are in the rooms into which Alice must move. At this point, arcade skills enable the player to jump Alice onto pantry shelves, float her via parasol down long tunnels, and generally help her meet the challenges of Wonderland.

In Wizard of Oz, a good parser makes it easy to have believable dialogues with such characters as the Scarecrow and the Cowardly Lion. All the characters that Dorothy meets along the Yellow Brick Road are very much from the Baum book and the Hollywood movie.

The on-screen illustrations are not flashy. They utilize the Apple's graphics well, but in a way that appears more like a children's storybook than an epic cartoon novel. This, of course, is the way you would want such a story to be told.

All the Windham Classics exhibit an understanding of the books that they are bringing to another medium. Pick your favorite title and boot it up—odds are you won't be disappointed.

LOST IN MORDOR

On the other hand, **The Hobbit**, from Addison-Wesley, will not satisfy readers who have fallen in love with Tolkien's Middle Earth. Although the disk does feature many of the characters and situations found in the book, there is something missing.

It is what Tolkien himself once called a spirit



SWORD OF KADASH



WIZARD OF

FOR THE FUN OF IT

of "subcreation." According to Tolkien (in his essay "On Fairy Stories"), a fantasy setting must appear to the participant to be as rich in detail and possibility as the real world. Only by such attention to detail can a fantasy world seem as much a place to live in as the real world.

The Hobbit (program), unlike *The Hobbit* (novel), does not have this attention to detail. Many of the characters from the book are either missing entirely or have abbreviated parts to play. Bilbo heads off from home with only one dwarf (Thorin) and a strangely powerless Gandalf. It was quite a shock indeed the first time that Gandalf (Mithrandir, wearer of Narya the Ring of Fire, wielder of the fabled sword Galmdring the foe-killer, and a Valar from heaven itself) was instantly killed by a smelly old troll.

Sorry, but I'll just read the book (for about the thirtieth time).

BETTER THAN EVER

One of the very first games that showed the world what the Apple II was capable of doing for fantasy gaming was **Temple of Apshai** from Epyx. Winner of the first Charles Roberts award to a computer game, Temple of Apshai, for its time, was a wonder. Of course, that was almost five years ago and, since then, gaming and programming have both come a long, long way.

The good news is that the graphics of Temple of Apshai have been completely redone, the gaming system has been cleaned up and—once again—this is a classic and lovely game.

Epyx has included the dungeons from what used to be add-on games for the older Temple—The Upper Reaches of Apshai and The Curse of Ra—so there are now 12 levels of dungeons to explore and more than 500 rooms.

Graphics now include a much better use of color on the II as well as better movement of redrawn monster and warrior icons. But the real surprise lies in store for those with a IIe and memory card or IIc. This new version features absolutely spectacular use of the new Apple double high-resolution graphics!

When you venture into the double high-resolution dungeons, prepare to be dazzled. If you have ever looked at any other computer and wished that your Apple maybe had just a little more graphic ability—stop wishing. This game demonstrates that the new Apples are still the top.

Oh, and good news too for you Galactic despots: there's a new version of **Reach For The Stars** from Strategic Studies Group that is superb.

As before, Reach allows up to four players to compete building a galactic empire, with computer

opponents ready to fill in for any humans who aren't around. The game is played on a map of twinkling stars, each star having its own family of

planets. The planets may range from Earthlike to extremely inhospitable.

Future emperors must carefully explore and colonize their own spheres of influence and begin gradually building toward a galaxywide expansion. Starships must be

built and technology invested in, environments must be built up and social levels raised.

But watch out, because this new version features some of the most deadly computer opponents I've

ever faced. They can make Ming of Mongo look merciful as they crush your empire like a ripe fruit. Luckily, beginners can choose the older and still not very gentle opponents.

Other new items include limited intelligence, so that you really aren't positive

what your opponent is doing and variable movement for each type of ship, so that a starship cruiser can outrace a slow fleet of older vessels. Even before this revision, this was the finest science-fiction game published. It's also easier to get now, as Electronic Arts is distributing in the United States for game designers Roger Keating's and Ian Trout's Australian company.

Ad astra and keep your drives clean!//



THE HOBBIT



TEMPLE OF APSHAI

continued on page 50

ISTRATION SARAH WAI DRON

Music Graph

by PHILIP CHIEN



hen I purchased my Apple in 1978 my dealer showed me a music demo program on an IMSAI computer, and I decided to write a similar program for my Apple. Using the cassette version of Applesoft BASIC that came with my machine, I soon discovered that while Applesoft provided input and output control for most devices connected to the Apple (e.g., keyboard, screen, disk drives, printer), control for one device had been overlooked—the speaker.

In BASIC the only way of controlling the speaker is by typing a "Control-G"; this causes the speaker to beep. Applesoft makes no provi-

sion for controlling the frequency or duration of the beep. Fortunately, driving the speaker is fairly simple in assembly language. Accessing memory location -16336 (\$C030 hex) causes the speaker to emit a faint click. What an assembly language routine must do is control the frequency of the clicks, thus producing sounds of differing pitch.

The lines 130 & 140 of Music Graph contain an assembly language routine which uses two variables to control the speaker: frequency and duration. I experimented until I determined that a frequency value of 225 would produce a Concert A (440Hz). From that starting point it was easy to calcu-

late the values for the other notes. Music Graph allows you to code and play simple melodies, within a three octave range, on your Apple. I added the bar graph to take advantage of the Apple's graphics capabilities and enhance the program.

To use the program, type in the BASIC listing and save it on a DOS or ProDOS formatted disk. A demo song, "Daisy Bell (A Bicycle Built for Two)," has been provided. However, you can type in any song if you read sheet music. Just replace the data in lines 1000 to 9000, and insert the data for the notes you want to play. Type in and save each song separately.

Figure 1: Pitches

The notes in the "1" octave are half the values of the notes in the "0" octave, and notes in the "2" octave are one fourth of the values of the original notes, and half the values of the notes in the "1" octave.

Note 0 Octave		1 Octave	2 Octave
A	225	112	56
A#/Bb	212	106	53
В	200	100	50
B#	189	94	47
C	189	94	47
C#/Db	178	89	44
D	168	84	42
D#/Eb	159	79	39
E appropriate	150	75	37
E#	142	71	35
F	142	71	35
F#/Gb	134	67	32
G	126	63	31
G#/Ab	119	59	29

1.	0	D
HIGHITE	/ ·	Durations
I CE COIL		L'aller of the

rigure 2. Durations					
Note	Letter Used	Number of 1/16 Notes	Final Value		
Sixteenth note	S	1	16		
Eighth note	E	2	32		
Dotted eighth	X	3	48		
Quarter	Q	4	64		
Dotted quarter	D	6	96		
Half note	Н	8	128		
Dotted half	T	16	192		
Whole note	W	32	255		

PROGRAM BREAKDOWN

Lines 110-120 set up the lookup table for the notes on the chromatic scale.

Lines 130-140 read in the machine language note routine.

Line 160 puts the screen in graphics mode.

Line 170 reads in and prints the credits for the song.

Line 180 reads in the tempo. The higher the tempo, the faster the song is played. Putting in a 1 results in a slow song, and a 3 plays a very fast song.

Line 190 initializes a FOR/NEXT loop. The variable "J" determines where the bar is plotted on the screen.

Line 200 reads a note from the

DATA statements into a four character string variable "X\$". The first two characters determine what note is needed, and whether or not the note should be sharp. (A flat note should be entered as the corresponding sharp note—e.g., for B flat, enter A sharp). The third character determines what octave should be used, and the last character determines how long to hold the note.

Lines 220-240 calculate the pitch of each note. First the ASCII value of the note is determined, and one is added if the note is sharp. To raise a note one octave, you double the frequency (e.g. 880Hz is "A" above concert "A"), so to raise the note X octaves, you must multiply the frequency by 2^X power. Dividing the pitch by 2^X power lowers the pitch to the correct octave. Fig. 1 shows the various possible pitches.

The careful reader will notice that B# is the same as C, and E# is the same as F. Readers with musical knowledge will realize that this is because B# is the same as C, and E# is the same as F.

Lines 260-330 determines the duration of each note. A whole note is held for 255 cycles. A sixteenth note is defined as one sixteenth the value of a whole note. From that, the length of each note can be calculated by figuring out how many sixteenth notes it takes to make up the note, and multiplying it by 16 (the length of a sixteenth note).

A "W" is used for a whole note, a "T" is used for a dotted-half, an "H" is used for a half note, a "D" is used for a dotted-quarter note, a "Q" is used for a quarter note, "X" is used for a dotted-eighth note, "E" is used for an eighth note, and "S" is used for a sixteenth note. See Fig. 2 for the corresponding values for each note's duration.

In music a dotted note is that note, plus half its value (e.g., a dotted quarter note is the same length as a quarter plus an eighth).

Rests are obtained by putting a "6" in the octave register. This puts the note into the ultrasonic range, making it effectively a rest. Putting an "0" in instead of a note indicates that the song is over. Octaves begin with A natural, and end with G sharp. For example: "G#0H" is a G sharp half note, in the lowest octave. The next note up (1/2 step) is "A 1H".

Line 350 erases the bar for the old note, and line 360 plots the note, if it isn't a rest. The height of the note is determined by the pitch, and the duration controls the color. After the program plots the screen full of notes, it goes back to the left side, and begins again.//

Philip Chien is an Apple programmer living in Florida.

Listing on page 55



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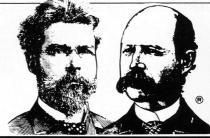
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Writing Programs for Children

Stimulus or straightjacket?

by STEPHEN VINCENT

Poet Steve Vincent runs computer classes for children. His studio lies in San Francisco's South of Market area, the part of town that's home to a new art scene. The studio itself, a converted warehouse, is light-filled with a city view and crowded with old oak desks, new computers and excited kids. Inside the room you hear no street noise and the fun of what's happening takes over. Steve is attentive and patient with his students; he makes suggestions quietly. The students pick up those subtle ideas and inspirations and . . . create.

On the following pages you'll see some of those creations and read first-hand about how Vincent propels these children to write and make pictures and what he thinks about some current commercial products that set out to do the same.

-II Computing Editors.

Scott Joiner and Michael Grantham, two eightyear-old boys, decided to work on a project together. I watched them do so for several days. Using a paint tablet, they were developing a series of colorful and often complex images: exploring underwater Atlantis's shipwrecked realms, then proceeding to interplanetary travel images – battle-filled planets interspliced with images of the shrinking view of Earth. Each day, when they finished a new segment, they would play back the gallery of images with an action-packed narrative for the rest of the class, as well as for the parents arriving to pick them up. In an interesting way, their original idea for a story provided the impetus to make pictures. However, the computer helped create the images and thus the story. Because the pictures always come out differently from what was imagined, they became the source of a new story to tell. The medium of the computer graphic had taken them down a new story path.

DOING WHAT COMES NATURALLY

Most children take naturally to mixing their writing with picture-making, and I find that paint pro-

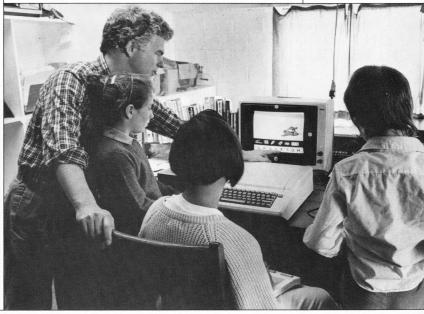
grams, combined with a tablet or pad, are a wonderful resource for making new stories or illustrating old ones. The abundance of graphic options and the enormous range of color choices, combined with multiple kinds of brush strokes and such fun functions as mirroring, k lines and magnify, are extremely attractive. Furthermore, the pictures can inspire the writing.

For parents and teachers working with the word processor, it's helpful and often necessary to prompt children to write creatively. Typing to the screen offers a huge advantage over writing on paper: it is much simpler to add material, revise and correct mistakes. The empty screen, however, can be quite intimidating, so it helps to have story starter ideas. There are not, to my knowledge, an abundance of books that deal with working creatively

continued on next page

Steve Vincent and students using Story Maker

Since writing this article, Stephen Vincent has authored two writing programs for Sunburst Communications, I Can Write (second grade) and Be A Writer (third grade), designed to work with Sunburst's Magic Slate word-processing program.



PHOTOGRAPHY ERIK WEBER

EDUCATION

with students and a word processor. But there are many books—for example, those by Herb Kohl and Kenneth Koch—that contain a wealth of writing ideas that are easily translatable to the screen.

For the last few months I have been working with Magic Slate, a word-processing program from Sunburst. The program has disks for 20-, 40-, and 80-column usage. The 20-column board makes and prints large block-size letters. (See Figure 1.) Young children genuinely love to write with and read them. An interested parent, or a teacher, can put letters or words on the screen from which young people can make words or sentences. Personal name acrostics, or verbs that show action such as skip, jump, climb are simple ways to provoke creative input. If you provide children with magic markers, they will immediately fill their printouts with images that illustrate and give a colorfully dramatic dimension to the writing. In my experience, children find their printouts to be a wonderful form of first publication. They love to make multiple copies on the printer and then share them with other children and their parents and send them off in the mail to grandparents and relatives.

WHAT ELSE IS AVAILABLE?

With just a little imagination and inventive use, word-processing and paint programs are terrific catalysts for stories that children want to make, see, read and hear. But what about some of the commercial story-writing products that combine text and graphics?

Well, I think we can look forward to the day when personal computers will have the built-in memory capacity to offer story-making programs that will offer a flexible and sophisticated mix of graphics, text . . . and even include the use of sound and voice! I find such potential awesome. Ideally, this computer concept of integrated story-making presents a lovely vision for children. However, from what I have seen, there is not yet any personal computer program that combines a paint and text program and is still flexible.

Bank Street's **StoryBook** is a good example of the limits of a program that combines both mediums. On all levels of production—both the manual and the disk tutorial—the program is well-intentioned. The manual is excellent: well-designed and readable. This booklet is full of learning examples that illustrate the program's creative potential, and the technical information is complete, clear and useful. The flip side of the disk also provides an excellent text and graphic demonstration of the program. In addition, there is a well-presented tutorial and samples of students' works. In other words, StoryBook is well-conceived and produced.



Michael Grantham, Kala Habal and Jody Williams (I. to r.)

What could be wrong with it? Unfortunately, StoryBook is aesthetically limited, slow and cumbersome to use. The graphics are quite primitive. Choices of line and color options are presented alongside the work screen. You compose the drawings (with either joystick or KoalaPad) with a longor short-line cursor stroke, either of which you must draw to the screen by pushing the fire button or pad key. The limited colors fill the space inside or outside the lined shapes or figures. Consequently, unlike most computer graphic "paint" programs on the market, the StoryBook images are confining in shape and weak on color. More seriously, at least for my nine- to twelve-year-old students, the cursor line, with either the joystick or KoalaPad stylus, is difficult to use.

The word-processing part of the program probably takes up most of StoryBook's memory. You can position the text, in a font that looks like your old typewriter type, anywhere on the screen. The type option opens up a cursor-established black space into which the story words are fitted. It takes some time to learn to use the cursor to establish the space you need for the number of required words without interfering with other images on the screen. Unfortunately, this technical factor becomes one more impediment to telling a story.

Perhaps with a great deal of patience StoryBook would yield what it promises, but neither I nor my students were willing to persevere.

Scholastic's **Story Maker** makes another kind of technical attempt to bring stories to both visual

EDUCATION

and textual life. This package, which comes in a large binder, is designed primarily for schools. Superficially, it's appealing. Operated by joystick or KoalaPad, Story Maker comes with drawing and type functions. You can draw with a freemoving brush stroke-limited to thick or thinwith choices of 16 colors or textures. The diverse type function offers a choice of eight different styles, from fonts of big blacktype letters to an art deco Gothic. In addition, on separately accessible disks, Story Maker comes with a Main Picture Gallery, a Fantasy Picture Gallery and a Science Fiction Picture Gallery. Each of these galleries is composed of a visual database of approximately 52 images that appear on one screen. Any of the images, like children's color stickers, can be transposed to fit on the story screen, where they can appear in a large or small version, or made to flip in the opposite direction. With a repertoire of text, paint strokes and gallery images, this program ideally allows students to create a story of several consecutive pages that can be viewed on the screen or printed out in black and white.

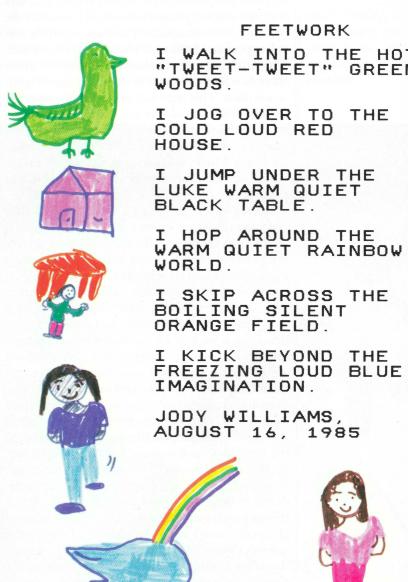
Again, unfortunately, the vision is much greater than the result. For starters, Story Maker is slow and cumbersome. It requires the manipulation of three disks (Program, Picture, Data), which is a form of "butterfinger roulette." It takes an amazing amount of screen concentration to get a balance between type fonts, picture gallery choices and the paintbrush stroke. The small screen size, which can hold a limited amount of type and visual material, is part of the problem. In addition, the fantasy and science-fiction gallery images lie flat and colorless on the screen. They have none of the vibrancy of real color stickers, nor do they provide a genuine dramatic punch from which students might be driven to master the full screen vocabulary and sustain a multiple-page story. Some of the type fonts are, indeed, fun to play with. The big letters look great on the screen and take on a dramatic story effect by themselves. Unfortunately, my students were too quickly turned off by the program before this opportunity emerged.

Adventures in Space and Tales of Me from Woodbury Software represent yet another approach to prompting students to make stories. On the screen, each program is text centered, and neither program involves the creation of visual images. Where both StoryBook and Story Maker risk relatively open-ended material from the child, these Woodbury products give writers an opportunity to unwittingly enter elements of an established story frame.

For example, in Tales of Me, the writer is asked to provide a series of responses to questions about a character's birth and, over a series of chapters, the story of his or her life. The responses range from multiple-choice answers to the writer's input. At the end of a chapter, it is then possible to read, as well as edit, a story that is compiled in a "fill in the blank" mode taken from these responses. Depending on the imagination of the writer, the story is good for at least a laugh. Tales of Me reads like a parody of an autobiography. Adventures in Space reads, as well, like a parody of comic-book science fiction. The program comes packaged with bookbuilding materials, including a hardcover jacket, fanfold book-size paper, color stickers and other materials. Both packages are designed to give users the illusion that they have written a book.

continued on next page

FIGURE 1



FEBRUARY / MARCH 1986

However, after the first laugh at the contents, the Woodbury packages present silly and misleading ideas about the nature of creative work. Ironically, many people with only one disk drive will discover that the company, in its quest to protect its product, makes it impossible to use the program without a second disk drive to configure the data disk.

A TRANSITIONAL POINT

I suspect we are at a transitional point with "application" software. One part of the industry will continue to aim towards controlling the user's behavior. Like the leadership of an orthodox group of any kind, the impulse behind the software will be to establish the "right" frame for the work, and govern responses of the user to stay within that frame. In the commercial story-writing programs, no matter how open-ended, there is an approach that says text and graphic images will take place within the medium of the computer. The images and the text will appear and fulfill their intentions on the screen. The printed copy will always be a kind of afterthought—a footnote to the electronic age of communication. This approach perceives the computer as self-fulfilling tool. As the computer becomes more sophisticated, the assumption is that the machine will become the primary tool for all other mediums: Music, visual images, writing . . . everything will be transmitted through the silicon channel.

Such a vision, as I hope I have shown, is contrary to my own experience with students, as well as my own creative work. Fortunately, it is true, the personal computer will become increasingly sophisticated as a creative tool. It will be the central catalyst through which many of the different arts-image, text, sound, voice-will network their way into a new collaborative and creative home. Yet, I think we will see the computer as perhaps one element of the completed work. What we will see is that the computer generates responses that do not necessarily coalesce best on the screen. The drawings students make on the printouts of their stories with color markers, for example, are often much more complex and deeply orchestrated than the story they have written. I have no doubt that the experience, however, of working with the equipment and sharing in its empowerment, propels the desire to draw. I also like the fact that the act of drawing on paper requires different kinds of muscles and sensory responses than working on the screen's tight grid. Yet the one activity pollinates the other. Similarly, the stories that students tell vocally, which also involve a range of physical movements in the telling, are something that the computer will never match. The juxtaposition, how-



ever, of the computer as a medium, combined with the other traditional mediums, is a revolutionary position in which students are integrating all their senses as they make a new work. Instead of trying to proceed to develop the computer as a selfcontained universe, I suggest it's time for the industry to develop its story- and image-making software with a much more open-ended acceptance and embracing of a computer world that integrates the resources that live outside the screen.//

PRODUCT INFORMATION

STORYBOOK Mindscape, Inc. 3444 Dundee Road Northbrook, III 60062 (312) 480-7667 64K; \$39.95

STORY MAKER Scholastic, Inc. 730 Broadway New York, NY 10003 (212) 505-3000 64K:

Educator's Price: \$95;

Retail Price: \$118.75 ADVENTURES IN **SPACE** TALES OF ME Woodbury Software 127 White Oak Lane, CN #1001 Old Bridge, NJ 08857 (201) 679-0200 64K; \$39.95

MAGIC SLATE Sunburst Communications, Inc. 39 Washington Ave. Pleasantville, NY 10570 (800) 431-1934 64K; \$89.95

KOALAPAD Koala Technologies, 2065 Junction Avenue San Jose, CA 95131-2105 (408) 946-4483 64K; printer recommended; \$125

Mountain Skiing II

by ANDRE PERSIDSKY

From the top of the lift Donald Tracer can see all the way down the side of the mountain to the lodges below. The upper slopes are clear, except for moguls and occasional boulders, until scrubby bushes begin to assert themselves below the treeline. Then broad avenues of white meander among the firs and pines as growth becomes denser. Clusters of skiiers swoop along, dodging ski-mobiles and each other, as they descend into the valley.

Sun above, snow below. Donald adjusts his goggles and grips his poles. This is his third run of the day. He should be able to make two more before dark.

How many runs can you make? Turn left and right by pressing the [J] and [L] keys, and stop sideways movement by pressing any other key. Be sure the CAPS LOCK key is down. The first several rounds should be easy, because your position high on the scrolling slope gives plenty of warning about the advancing terrain. As you advance in levels, your skier rides lower and obstacles proliferate. If you wipe out five times, you'll have to start again (unless you break into the program and increase your chances). To advance another level you must make it down to the lodge.

Mountain Skiing II uses high-speed drawing routines in machine language, but if you want to incorporate some runs of your own, all you have to do is add some BASIC subroutines. The ski map that scrolls up is drawn before each game and is modified between levels. The map is 6096 bytes long and contains all the shapes except for the skier. The ski map starts at location 16384 and ends at location 22480 (hi-res page two). Each screen is 220 bytes long, making the whole map about $27\frac{1}{2}$ screens long.

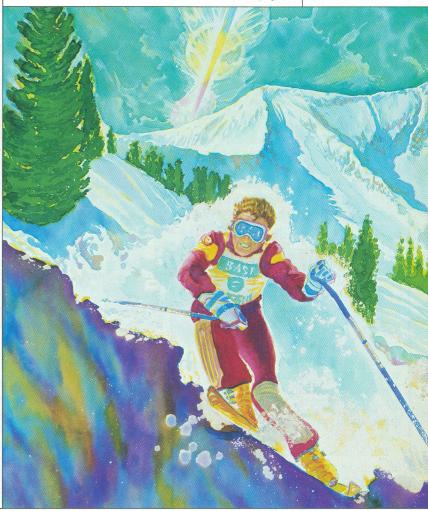
All of the scrolling objects are represented by a number which is an offset for the shape data of

that shape. These numbers are stored directly in the ski map, as the program does in lines 560 through 670. When the computer scrolls the map, it sequentially reads the numbers stored in the ski map and draws the corresponding shape onto the screen.

college student, programs for the Atari and Apple computers.

Andre Persidsky, a

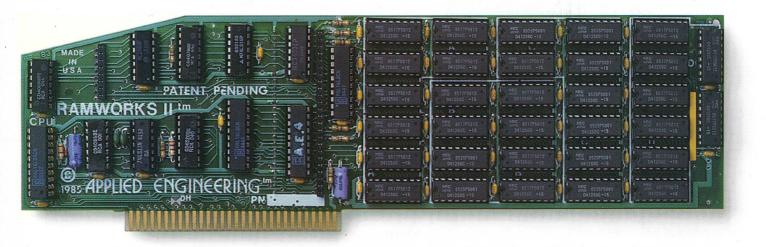
continued on page 50



LLUSTRATION JOHN GARCIA

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256K	188K
512K	378K
1 MEG	758K
1.5 MEG	1136K
3 MEG	2277K

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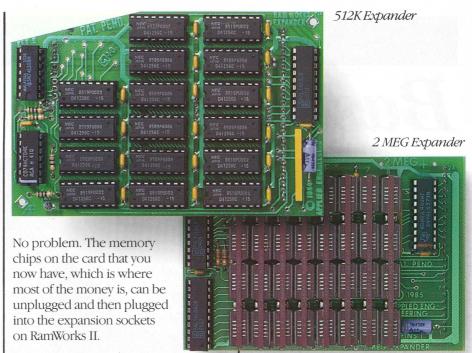
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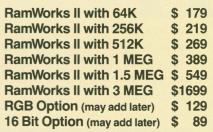
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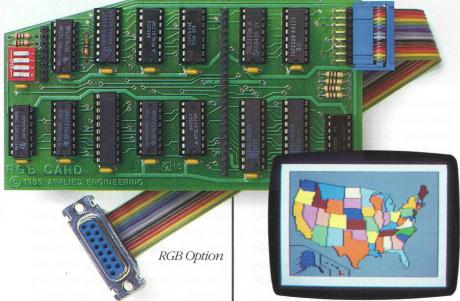
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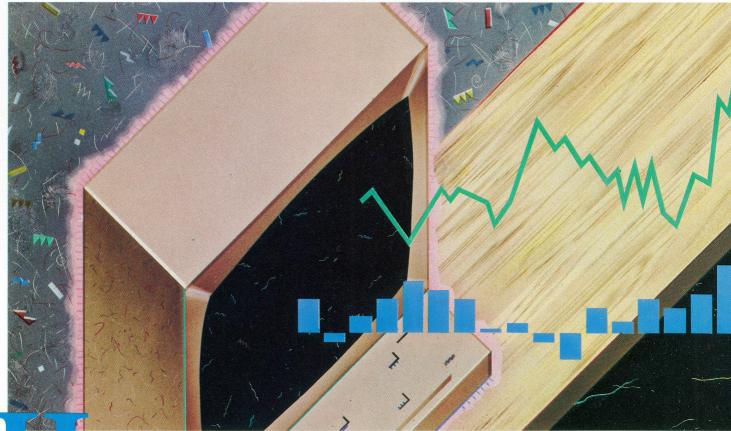
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Basic Graph by WILLIAM V.R. SMITH



ow about creating a pie chart or bar graph simply by entering the proper labels and numbers in a table? You can do that with Basic Graph. If you've already worked out your figures, you can easily get a visual representation of those numbers.



Basic Graph, which uses a subroutine presented in an earlier article ("Text Handling in Hi-Res," II Computing, Oct/Nov 1985), creates visually appealing pie and bar graphs on the hi-res display of your Apple computer.

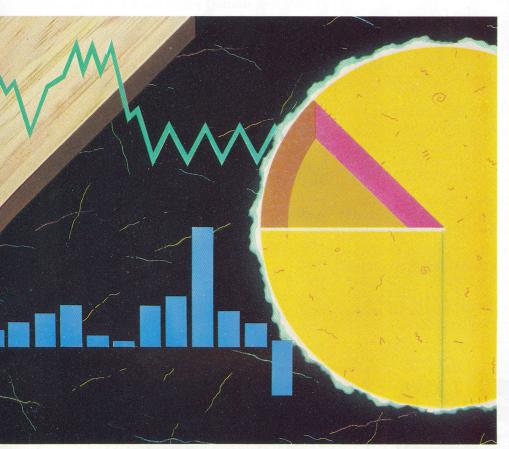
The subroutines used in Basic Graph are the 70-column hi-res character driver and a new circledrawing routine. The 70-column routines have been modified slightly to perform the desired functions, so the program is presented here in its entirety.

The first thing BASIC programmers will notice is that the remarks statements are greatly reduced in Basic Graph. This program makes use of the hi-res screen and a fair number of variables to do the 70column character display. This consumes a large amount of the available memory in the Apple II.

The first problem caused by the memory limitations was that Applesoft started to store variables in the hi-res screen memory, destroying the appearance of the Basic Graph display. The solution to this problem was easy. I simply used LOMEM: 16384 in line 10, which starts variable storage above the hires memory. The program itself stops just short of \$2000, the beginning of hi-res page one. Adding further remarks would put it over the edge. Any part of the program that was higher in memory than \$2000 would be cut off when the HGR command was executed.

The accompanying illustration shows the bar graph function. Basic Graph also gives you a pie chart. Of course, the type of data usually dictates which one you use.

Now let's discuss the operation of Basic Graph. After you enter the program and type RUN, the program should go to the hi-res screen,



draw the Basic Graph screen, and display a blinking bar under the edit titles prompt. If you press any key other than RETURN, the bar will advance to the next prompt. After the fourth prompt, it cycles back to the first. By placing the flashing bar under any one of the prompts and pressing RETURN, you can perform the specified operation.

Let's begin with edit titles. Place the bar under the edit titles line and press RETURN. The program prompts you with the number 1 and asks you to type in the first title. Type January and press RETURN. The program prompts you for the second title; type February. Enter all the months through June. When you have completed this and you are on title number 7, simply press RETURN without entering a value to leave the edit mode and return to the prompt command mode.

Next, go to the edit values prompt and press RETURN. You are then prompted with the first title you typed in and asked for a value. Enter any positive values you wish for each of the six months. As soon as you have entered the value for the last title, you are sent back to command mode. If you have made any mistakes in entering the titles or amounts, you can go back to the edit titles or edit values mode. For each piece of data, you are shown the current title or value. If it is correct, simply press RETURN. If it is not correct, you can retype it and continue.

After you have typed in the proper information, place the bar under the draw graph prompt and press RETURN. The program asks you to type 1 for a pie chart or 2 for a bar graph. Make your selection and watch the chart appear. If you wish, you may go back to the draw graph

function and select the other type of display.

Now go to the disk I/O section and press RETURN. You will be prompted with:

1-LOAD 2-SAVE 3-CLEAR

If you select Load or Save, you are presented with a catalog of the disk and asked to enter a file name. If you select Clear, the graph and all of the data are erased and the system restarts.

One other feature has been added to the edit title system. If you wish to chop off data from the end of your list, edit titles and press RETURN until you get to the first one to delete. Then enter a period and press RETURN. The system then removes everything beginning with the line on which you entered the period. This little trick can help you graph smaller sections of your data.

The speed at which the BASIC version of Basic Graph operates is acceptable but can be greatly improved by compiling. For those of you who have the SpeedStar compiler from Southwestern Data Systems, line 2265 has the SpeedStar command to jump the compilation around the hi-res screen. The bar chart shown takes 43 seconds to draw in Applesoft but only 14 seconds when the program is compiled with SpeedStar. If you have another compiler, I'd be interested in hearing how much it improves the speed of Basic Graph.

Note: Lines 2500, 2515, 2930, 3250, 7040, 9320 and 9410 contain remarks concerning the number of spaces between quotes. Do not type these remarks in, as they make the program too long, causing it to crash.

If your printer can print a copy of the hi-res screen, then press reset and type the proper command used by your printer to dump the hi-res screen.//

Listing on page 60

Bill Smith is president of Artsci, a software company specializing in business products for Apple II, and a former contributor to Softalk. FOR THE FUN OF IT continued from page 37

PRODUCT INFORMATION

WINTER GAMES

TEMPLE OF APSHAI

Epyx, 1043 Kiel Court, Sunnyvale, CA 94089; (408) 745-0700; 64K; \$39.95 (both programs)

SWORD OF KADASH

Penguin Software, 2600 Keslinger Road, POB 311, Geneva, IL 60134; (312) 232-1984; 48K; \$34.95

ALICE IN WONDERLAND TREASURE ISLAND

SWISS FAMILY ROBINSON

Windham Classics, 1 Kendall Square, Cambridge, MA 02139; 64K; \$26.95

THE HOBBIT

Addison-Wesley, Jacob Way, Reading, MA 01867; (Addison-Wesley does not sell program. Purchase from a software store.) 64K; \$34.95

REACH FOR THE STARS

Strategic Studies Group, US distributor: John Gleason, 1747 Orleans Court, Walnut Creek, CA 94598; (415) 932-3019

or: Electronic Arts, 2755 Campus Drive, San Mateo, CA 94403; (415) 571-7171; 48K; \$44.95

GAME FRAME

continued from page 45

Between games, the map must be cleared, and this is done by (CALL 24532). If you would like to make your own maps, change line 740 to point to your own routine, which fills the ski map. To add shapes to the map between certain levels, look at lines 870 through 890. The variable L stands for the level and the GOSUBs you see there are for adding objects to the map. Simply change these GOSUBs to your own routines, which poke the shape numbers into the map.

The time it takes for certain shapes to scroll up will depend directly on how far down they are in the map. Don't forget (CALL 24532) if you want to clear the map.//

Shape Numbers

tree = 1small rock = 55large rock = 76bush = 36flag = 105left side of lodge = 184 right side of lodge = 213 snowmobile = 128cabin = 147

Listing on page 58

PASCAL For the Apple

kyan pascal is designed for both students and advanced programmers. It's a full Jensen/Wirth Pascal implementation and runs in ProDOS.

kyan pascal is easy to use, lightning fast, and loaded with features. It compiles and runs 4 times faster than Apple Pascal and more than 30 times faster than Basic.

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kyan pascal requires 64K of memory and a single disk drive. No additional hardware is necessary. And, it comes with kyan's MONEY BACK GUARANTEE...If not completely satisfied, return it within 15 days for a full refund.

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SOFTWARE LIBRARY

Il Computing's type-in listing section includes every full-length program from this issue. We've included them all together for your convenience. It will be easy for you to remove these pages and save them in a binder if you wish.

All of the following programs work with DOS 3.3 and Pro Dos.

TYPO II MAKER This program helps you catch all typos. See page 52 for accompanying article.
-Tales From the Crypt MORE TOOLS FOR DECIPHERING
-Sound Ground MUSIC GRAPH
-Advanced Computer Concepts CELLULAR AUTOMATA
-Game Frame MOUNTAIN SKIING II
-Hi-res Graph Maker! BASIC GRAPH
-Graphics HI-RES TO PRINT SHOP CONVERTER
-II ERR IS HUMAN
Important Notice For Action Disk Buyers

FEBRUARY / MARCH 1986

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TYPO II (TYPE YOUR PROGRAM ONCE)

Nothing is more frustrating than typing in a long program, only to find it doesn't work. At *II Computing* we are careful to test each program listing before publication, and all listings are computer generated, so they should be accurate.

Therefore, if your typed-in program doesn't work, you probably made a typing error. Fortunately, if you use TYPO II, it's easy to find and fix most of those mistakes.

TYPO II is a program that verifies your typing accuracy after you enter BASIC listings from our magazine. TYPO is an acronym for "Type Your Program Once." We will use this program to help you with BASIC listings in all future issues of *II Computing*.

With TYPO II, you have two ways to check your work. (1) It generates a two-letter code for each program line. This protects against misstrikes, transpositions, dropouts and extra characters. (2) It generates a total checksum for the whole program that requires all lines to be correct and in the correct order.

	PROE	RAM: S	AMPLE	CODES	
CODE	LINE#	CODE	LINE#	CODE	LINE#
SI	10	SF	40	SH	70
MS	20	67	50	DS	80
RA	30	ST	60	NV	90

TOTAL CHECKSUM = 315162

When you use TYPO II on your program, you should get the same line codes and checksum that appear for that program in the magazine. If you don't, there is a typing error in the line or lines where your codes and ours do not agree.

IMPORTANT: TYPO II works with Applesoft BASIC running with DOS 3.3 or ProDOS. It does not work with Integer BASIC. Correct spacing is very important. Applesoft automatically inserts one space after each REM or DATA command, so keep this in mind when entering your lines. Check spacing first when lines codes do not agree.

HERE'S WHAT YOU DO

- 1. Load DOS 3.3 or ProDOS into memory, then insert a formatted disk in your disk drive.
- 2. When you see the symbol], you are in Applesoft BASIC. Proceed to type in the TYPO II MAKER program from this magazine (see listing). You only need to do this once; thereafter you load TYPO II from your disk. Note: ProDOS does not permit spaces in file names, so enter TYPO II as TYPOII, and TYPO II MAKER as TYPOII.MAKER.
- 3. Verify this program carefully the old way. It is possible to use TYPO II to check itself, but this would cause

more problems than it's worth.

- 4. Now, run the TYPOII.MAKER program. This saves a text "command" file named TYPOII on your disk. Your Apple executes this command file just as if you entered it from your keyboard. Also, the "maker" program creates a binary file for its assembly language routine. For protection, make an extra copy on a different formatted disk by running TYPOII.MAKER again.
- **5.** Type in any BASIC program from our magazine, including spaces as indicated and complete REM statements for all lines requiring them.
- **6.** Remember: Always save your typed-in program to disk before you run it. This backup file helps protect you against mistakes, power loss, misunderstood instructions, computer lockup, and so on.
- 7. Then type EXEC TYPOII (return). You have now loaded the TYPOII command file from disk. The letter codes are displayed vertically on the screen next to their corresponding line numbers. You can see them again by typing the command RUN 63000 (return). To pause and restart display, type (control)-S simultaneously.
- 8. Compare your line codes and checksum to those in the magazine. If your line code is different from the code in the magazine, you have made a typing error on that line. The final checksum will not agree until every line code in the program matches those printed. There is a remote possibility that all line codes will agree, but the final checksum will not. This can happen when errors occur in a line that generates the same letter codes as the correct line, and the two errors cancel each other out.
- 9. To correct a specific line, type LIST (line number) (return). You can then edit and correct that line. Occasionally, the line may appear to be absolutely correct, but the line codes will not agree. This is probably due to typing a control character that does not appear on the screen. Retype the entire line and try again. When you have made all corrections, type RUN 63000 (return).
- **10.** Repeat the process of comparing and correcting until all the codes and checksums agree.
- 11. Delete TYPOII from your now corrected program with the command DEL 63000,63150 (return).
- **12.** SAVE your program to disk, and delete the uncorrected backup file from your disk.

To use TYPO II with subsequent programs, call TYPO II from disk after typing in your program by entering the command EXEC TYPOII (return). This appends TYPO II to your program and runs it on all program lines lower than 63000. //

TYPO II MAKER

```
10 D$ = CHR$ (4):F$ = "TYPOII"
20 FOR I = 0 TO 41: READ A: POKE
    768 + I,A: NEXT
30
    PRINT DS; "BSAVE TYPOII.OBJ, A
    768, L42"
   PRINT D$; "OPEN"; F$: PRINT D$
40
    ; "WRITE"; F$
    PRINT "BLOAD TYPOII.OBJ"
50
    LIST 63000,63150
70
    PRINT "RUN 63000"
80
   PRINT D$; "CLOSE"; F$
90
   END
100
    DATA
           160,1,132,30,164,30,1
    66, 30, 24, 177, 25, 240, 28, 101
    DATA 27,133,27,144,15,24,1
    65, 28, 105, 1, 133, 28, 144, 6
120
    DATA
           165,29,105,0,133,29,2
    02,208,227,230,30,208,219,96
63000
       REM
            TYPO II
63010
       REM
            BY GERRY VILLAREAL
63020 REM
            (C) 1985 ANTIC PUBLI
    SHING INC.
63030 REM II COMPUTING
63040 TEXT : HOME : PRINT
                             SPC(
    11): "CODE
                  LINE NO.": POKE
```

```
34,1
63050 CH = 0:C1 = 256:S = PEEK
    (103) + PEEK (104) * C1
63060 \text{ S1} = \text{S} + 3:\text{N} =
                      PEEK (S) +
     PEEK (S + 1) * C1
63070 LINE =
             PEEK (S + 2) +
                               PEEK
    (S + 3) * C1
      IF LINE = 63000 THEN
63080
                              PRINT
     SPC( 7); "TOTAL CHECKSUM = "
    ; CH: POKE 34, Ø: END
63090
      POKE 25,S1 - INT (S1 / C
    1) * C1: POKE 26, INT (S1 /
    C1)
63100
      POKE 27,0: POKE 28,0: POKE
    29,0: CALL 768
63110 LV = PEEK (27) + PEEK (2
    8) * C1 + PEEK (29) * C1 ^
63120 CODE = LV - INT (LV / 676
    ) * 676
              INT (CODE / 26):L
63130 HCODE =
    CODE = CODE - (HCODE * 26)
63140 PRINT SPC( 12); CHR$ (HC
    ODE + 65); CHR$ (LCODE + 65)
    : SPC( B):LINE
63150 CH = CH + LU + LINE:S = N:
     GDTO 63060
```

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MORE TOOLS FOR DECIPHERING

Article on page 29

```
REM * TALES FROM THE CRYPT
    PART3
   REM * BY CAXTON FOSTER
20
   REM * (C) 1985 ANTIC PUBLIS
   HING INC.
   REM * II COMPUTING VOL.1 NO
40
50 ONERR GOTO 80
60 DIM C%(256), A%(26), D%(26), F%
    (26)
70 REM * MENU
80 HOME : UTAB 2: HTAB 17: PRINT
    "MENU": UTAB 5: HTAB 10: PRINT
    " < 1 > ENTER TEXT ": UTAB 7
    : HTAB 10: PRINT " < 2 > FRE
    QUENCY": VIAB 9: HTAB 10: PRINT
    " < 3 > END ": GET A
90 ON A GOSUB 1000,2000,3000
100 GOTO 80
499 REM * TEXT ENTRY
500 HOME
510 FOR I = 1 TO 256
520 C%(I) = 32
530 PRINT "ENTER YOUR TEXT. END
    IT WITH A '/'."
540 PRINT "PRESS CAPS LOCK TO G
   ET ALL CAPS.": PRINT
550 N = 0
560 GET R$
570 X = ASC (R$)
580 IF X = 8 AND N = 0 THEN 560
590 IF X = 8 THEN PRINT " CHR$
    (B) CHR$ (B); C_{N}^{*}(N) = 32:N =
   N - 1: GOTO 560
600 IF R$ = "/" THEN 650
610 N = N + 1
620 C%(N) = X
630 PRINT RS;
640 IF N < 256 THEN 560
650 REM * DISPLAY CIPHER AND P
   LAIN TEXT
    HOME
660
670 FOR I = 0 TO N - 1 STEP 40
680 FOR J = 1 TO 40
690 PRINT CHR$ (C%(I + J));
700 NEXT J
710 FOR J = 1 TO 40
720 T = C%(I + J) - 64
730 IF T < 1 OR T > 26 THEN PRINT
    CHR$ (T + 64);: GOTO 750
740
    PRINT CHR$ (A%(T));
    NEXT J: PRINT : NEXT I
UTAB 22: PRINT "PRESS ANY K
    EY TO CONTINUE": GET AS: RETURN
770 NEXT I
```

```
999 REM * GET KEYWORD
1000 HOME
1010 PRINT "ENTER KEYWORD. END
    WITH '/'
1020 PRINT "USE ONLY THE LETTER
    S A-Z.
1030 K$ = ""
1040 VTAB 5
1050 GET R$
1060 IF R$ = CHR$ (8) THEN 113
1070 IF R$ = "/" THEN 1180
1080 IF R$ < "A" OR R$ > "Z" THEN
   1050
1090 \text{ K$} = \text{K$} + \text{R$}
1100 UTAB 5: HTAB 1: PRINT KS"
1110 UTAB 5: HTAB LEN (K$) + 1
1120 GOTO 1050
1130 L = LEN(KS)
1140 IF L = 0 THEN 1050
1150 IF L = 1 THEN K$ = "": GOTO
    1100
1160 K$ = LEFT$ (K$,L - 1)
1170 GOTO 1100
     REM GET SHIFT AND SET IT
1190 PRINT : INPUT "ENTER SHIFT
     0-25; ";5
1200 IF S < 0 OR S > 25 THEN 11
    90
1210 S = S + 1
1220 L = LEN (KS)
1230 FOR I = 1 TO L
1240 X = ASC ( MID$ (K$,I,1)) -
   64
     IF C%(X) > 0 THEN 1300
1260 \ C_{*}(X) = 1
1270 \ A%(S) = X + 64
1280 S = S + 1
1290 IF S > 26 THEN S = 1
1300 NEXT I
1310 FOR I = 1 TO 26
1320 IF C%(I) > 0 THEN 1360
1330 A%(S) = I + 64
1340 S = S + 1
1350 IF S > 26 THEN S = 1
     NEXT I
1360
1370 REM * BUILD DECODE ALPHAB
1380 FOR I = 1 TO 26
1390 X = A%(I) - 64
1400 D%(X) = I + 64
1410 NEXT I
1420 GOTO 500
1999 REM * COUNT LETTER FREQUE
    NCY
```

780 RETURN

```
2000
     HOME
     FOR I = 1 TO 26
2010
2020 F%(I) = 0
2030 NEXT I
2040 FOR I = 1 TO N
2050 X = C%(I)
    IF X < 65 OR X > 90 THEN 2
   090
2070 X = X - 64
2080 F%(X) = F%(X) + 1
2090 NEXT I
2100 P = 0: PRINT "SCREEN OR PRI
    NTER OUTPUT? (S OR P)": GET
2110 IF LEFTS (AS,1) = "P" THEN
   P = 1
2120 IF P THEN DS = CHR$ (4): PRINT
    "PLEASE TURN ON YOUR PRINTER
    ": PRINT D$; "PR#1"
2130 PRINT "PRESS ANY KEY TO CO
   NTINUE, "
2140 GET R$
2150 PRINT
2160 HOME : PRINT "LETTER FREQU
   ENCY "
2170 M = 0
2180 FOR I = 1 TO 26
2190 IF F%(I) > M THEN M = F%(I
   ):II = I
2200 NEXT I
2210 IF M = 0 THEN 2250
2220 PRINT CHR$ (II + 64)" "F
    %(11)
2230 F%(II) = 0
2240 GOTO 2170
                PRINT D$; "PR#0"
     IF P THEN
2260 UTAB 22: PRINT "PRESS ANY
   KEY TO CONTINUE": GET AS: RETURN
2999 REM
            * QUIT
3000 HOME : PRINT "ARE YOU SURE
    YOU WANT TO QUIT? (Y OR N)"
3010 GET AS: IF LEFTS (AS,1) =
    "Y" THEN
             END
```

TYPO II TABLE

Code	Line#	Code	Line#	Code	Line#
O I J J C H T E V G G F F R C A H Y R J F M P J F G S J W V G G J S G E C A V J J L M P J F G S J W V G G J S G E C A V J	10 30 40 60 60 60 60 60 60 60 60 60 60 60 60 60	O G K F R L P K R Z J A X X C H H I T W G B J B Q H S F N O U Q V K B N G Q V	780 999 1000 1010 1020 1030 1050 1060 1070 1080 1100 1110 1120 1110 1150 1160 1170 1180 118	O UBMRKAPKUIFQGKOWRQGWAWUEPNIIQPZRUZJBEJL	1389001003900100100100000000000000000000
KQ	770	KΩ	1360		

Total checksum = 1738929

MUSIC GRAPH

Article on page 38

```
* MUSIC GRAPH
10
    REM
20
    REM
         * BY PHIL CHIEN
         * (C) 1985 ANTIC PUBLIS
    HING INC
40
         * II COMPUTING VOL.1 N
    REM
    0.2
50
    DIM K(13)
    FOR A = \emptyset TO 13: READ K(A): NEXT
60
    DATA 225,212,200,189,189,178
    ,168,159,150,142,142,134,126
    ,119
```

3020 GOTO 80

```
FOR A = 770 TO 795: READ T: POKE
80
    A, T: NEXT
          173,48,192,136,208,5,2
    DATA
    06,1,3,240,14,234,234,234,23
    4,234,202,208,240,174,0,3,76
    , 2, 3, 96
100
    GR
    READ AS, BS: VIAB 21: PRINT
110
    AS: PRINT BS
    FOR J = \emptyset TO 39
120
130 READ X$
     IF X$ = "0" THEN
140
                        END
                           continued on next page
```

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```
150 \text{ AS} = \text{LEFTS} (XS, 1):BS = MIDS
    (X\$,2,1):C\$ = MID\$ (X\$,3,1)
    :DS = RIGHTS (XS,1)
160 S = K((ASC(AS) - 65) * 2 +
    (B$ = "#")) / (2 ^ VAL (C$)
170
    POKE 768,S
     IF D$ = "S" THEN W = 16
180
     IF D$ = "E" THEN W = 32
190
        D$ = "X" THEN W = 48
200
     IF
     IF D$ = "Q" THEN W = 64
210
     IF D$ = "D" THEN W = 96
550
     IF D$ = "H" THEN W = 128
230
     IF D$ = "T" THEN W = 192
240
     IF D$ = "W" THEN W = 255
250
260
     POKE 769, W
270
    COLOR= 0: VLIN 0,S * 39 / 2
    55 AT J
280
    IF VAL (C$) = 6 THEN VLIN
    0,39 AT J: GOTO 300
290
    COLOR= W / 16: VLIN S * 39 /
    255,39 AT J
300
    CALL 770
310
     NEXT J: GOTO 120
           "DAISY BELL ( A BICYC
    DATA
    LE BUILT FOR TWO)
           "BY HARRY DACRE"
330
     DATA
          D 1T,B 1T,G ØT,D ØT,E
     0Q, F#0Q, G 0Q, E 0H
350
     DATA G 00,D 0T,D 6T,A 1T,D
     1T,B 1T,G 0T,E 0Q
360
     DATA F#0Q,G 0Q,A 1H,B 1Q,A
```

	1W, A	6Q,B 1Q,C 1Q		
370	DATA	B 1Q, A 1Q, D	1H, B	1Q, A
	1Q,G	0W, A 1Q, B 1H		
380	DATA	G ØQ,E ØH,G	ØQ,E	OQ,D
	ØW, D	00,6 0H,B 10		
390	DATA	A 1Q, A 6Q, D	ØQ,G	ØH, B
	1Q, A	1Q, A 6Q, B 1E		
400	DATA	C 1E, D 1Q, B	1Q, G	ØQ,A
	1H.D	0Q.G 0W.0		000

TYPO II TABLE

Code	Line#	Code	Line#	Code	Line#
GV	10	ZM	150	WI	280
DI	20	MY	160	VW	290
JZ	30	BU	170	XJ	300
MT	40	MZ	180	ZP	310
QJ	50	IT	190	PU	320
UP	60	QI	200	ΙP	330
XH	70	NS	210	MN	340
HF	80	MX	220	ET	350
GK	90	KP	230	OE	360
FG	100	NP	240	QY	370
CA	110	OJ	250	ZH	380
CH	120	CX	260	JW	390
QD	130	LF	270	os	400
YZ	140				

Total checksum = 1090061

CELLULAR AUTOMATA

Article on page 26

```
* CELLULAR AUTOMATA
        * BY DANIEL WOLF PH.D
20
        * (C) 1985 ANTIC PUBLIS
    REM
    HING INC.
40
   REM
        * II COMPUTING VOL.1 N
    0.3
50
   DIM N(42), D(42)
    REM * MENU
60
   HOME : UTAB 2: HTAB 17: PRINT
    "MENU": UTAB 5: HTAB 10: PRINT
    " < 1 > LINECELL": UTAB 7: HTAB
    10: PRINT " < 2 > LINECELL5"
    : VTAB 9: HTAB 10: PRINT " <
     3 > END ": GET K$: A = VAL
    (KS)
    ON A GOSUB 1000,2000,3000
80
   GOTO 70
999 REM * LINECELL
1000 LM = 40:T2 = 32:T = 10
1010 GOTO 1040
1020 FOR A = 1 TO LM: PRINT CHR$
    (T2 + T * N(A)); : D(A) = N(A)
    : NEXT : RETURN
1030 PRINT : PRINT "USE ONLY 1'
```

```
S AND 0'S, PLEASE": FOR A =
    Ø TO 1000: NEXT : RETURN
1040 HOME : PRINT : PRINT " ENT
   ER A STRING OF 40 1'S AND 0'
    S"
1050 PRINT : INPUT S$
1060 L = LEN (S$)
     IF L > LM THEN L = LM:S$ =
1070
    LEFTS (SS,LM)
1080 FOR A = 1 TO L:B = VAL ( MID$
    (S$,A,1))
1090 IF B < > 1 AND B < > 0 THEN
    : GOSUB 1030: GOTO 1040
1100 \text{ N(A)} = \text{B: NEXT}
1110 HOME : VTAB 2
      GOSUB 1020
1120
1130
      FOR G = \emptyset TO 19
      FOR A = 1 TO LM
1140
1150 IF O(A - 1) = O(A + 1) THEN
    N(A) = 1 - O(A)
1160 PRINT CHR$ (T2 + T * N(A)
    );: NEXT A
1170 FOR A = 1 TO LM: O(A) = N(A)
    ): NEXT
```

1180 NEXT G 1190 PRINT : PRINT "HIT ANY KEY TO CONT OR <ESC> FOR MENU": GET KS 1200 IF KS = CHRS (27) THEN RETURN 1210 GOTO 1110 1999 REM * LINECELLS 2000 LM = 40:T = 32:T2 = 32 GOTO 2040 2010 2020 FOR A = 1 TO LM: PRINT CHR\$ (N(A) + T); : D(A) = N(A); NEXT: RETURN PRINT : PRINT " USE ONLY N UMERALS Ø THRU 4, PLEASE!": FOR A = 0 TO 1000: NEXT : RETURN 2040 HOME : PRINT : PRINT " ENT ER A STRING OF 40 0,1,2,3,4 DIGITS" 2050 PRINT : INPUT S\$ 2060 L = LEN (S\$)IF L > LM THEN L = LM:S\$ = 2070 LEFTS (SS,LM) 2080 FOR A = 1 TO L:B = VAL (MID\$ (S\$,A,1)) IF B < Ø OR B > 4 THEN : GOSUB 2030: GOTO 2040 2100 N(A) = B: NEXT2110 HOME : VTAB 2 2120 GOSUB 2020 2130 FOR G = 0 TO 19 FOR A = 1 TO LM 2150 SU = O(A - 1) + O(A) + O(A +2160 IF SU = 0 OR SU > 6 THEN N (A) = 0: GOTO 22002170 IF SU = 2 OR SU = 6 THEN N (A) = 3: GOTO 2200IF SU = 1 OR SU = 3 OR SU = 4 THEN N(A) = 1: GOTO 2200 IF SU = 5 THEN N(A) = 2 2190 PRINT CHR\$ (N(A) + T); : NEXT 2200 2210 FOR A = 1 TO LM: O(A) = N(A)): NEXT 2220 NEXT G 2230 PRINT : PRINT "ANY KEY TO CONT OR <ESC> FOR MENU": GET IF K\$ = CHR\$ (27) THEN RETURN 2240 GOTO 2110 2250 REM * QUIT HOME : PRINT "ARE YOU SURE YOU WANT TO QUIT? (Y OR N)" : GET K\$ IF K\$ < > "Y" THEN RETURN 3010 3020 HOME : END

TYPO II TABLE

Code	Line#	Code	Line#	Code	Line#	
NB PL	10	JZ NU	30 40	WY SZ	50 60	

ZL	70	HQ	1150	KR	2110
ŒΜ	80	MB	1160	HC	2120
ΩJ	90	WY	1170	BP	2130
BT	999	KM	1180	MX	2140
ΚU	1000	CO	1190	HM	2150
HD	1010	LC	1200	AD	2160
CB	1020	GU	1210	DG	2170
ΧJ	1030	CG	1999	CM	2180
MN	1040	FM	2000	GY	2190
UО	1050	HF	2010	UK	2200
ΙP	1060	NX	2020	WY	2210
IN	1070	RF	2030	KM	2220
BB	1080	CS	2040	IE	2230
DF	1090	UO	2050	LC	2240
AT	1100	IP	2060	GΨ	2250
KR	1110	IN	2070	VLI	2999
HA	1120	BB	2080	DT	3000
BP	1130	EQ	2090	GT	3010
MX	1140	AT	2100	ZB	3020

Total checksum = 1655036



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MOUNTAIN SKIING II

Article on page 45

```
REM * MOUNTAIN SKIING II
   REM * BY ANDRE PERSIDSKY
20
   REM * ASSISTED BY GREG YATE
        * (C) 1985 ANTIC PUBLIS
30
   REM
    HING INC.
   REM * II COMPUTING VOL.1 N
40
    0.3
50 BEGIN = 24466:CNT = 24505:ERA
    SE = 24532
60 L = 1:YP = 35:YSKILOC = 23827
    : POKE YSKILOC, YP: DEN = 100
   HGR2 : HOME : FLASH : TEXT :
    PRINT "PLEASE WAIT...": NORMAL
    :LIVES = 5
80 H1TBL = 23296: H2TBL = 23552: PRINT
    : PRINT : PRINT
90
   GOTO 690
100 N = 0
110 FOR T = 22984 TO 22984 + 10
120 POKE T,N
130 N = N + 17
140 NEXT T
150 POKE 16385,105: POKE 16400,
    105: POKE 22455,184: POKE 22
    456,213: POKE 22457,184: POKE
    22458,213: POKE 22265,105: POKE
    22283,105
160
    RETURN
    FOR T = 22784 TO 22784 + 12
180
    READ D
    POKE T,D
190
    NEXT T
200
210 DATA
          64,1,64,1,96,3,113,71
    ,106,43,100,19,104,11,96,3,9
    6,3,48,6,48,6,48,6,32,2,32,2
    ,32,2,32,2
    DATA 64,1,64,1,96,67,112,3
220
    9,81,21,82,13,84,1,104,3,96,
    3,96,3,96,70,64,38,64,63,64,
    13,96,4,24,3
    DATA 64,1,64,1,97,3,114,7,
    84,5,88,37,64,21,96,11,96,3,
    96,3,49,3,50,1,116,1,88,1,16
    ,3,96,12
    DATA 0,8,0,4,0,2,0,5,49,8,
    127, 31, 96, 127, 96, 127, 127, 31,
    49,8,0,5,0,2,0,4,0,8
250
260
    REM HGRTBL1 AND HGRTBL2 LO
    AD
270
    FOR T = 1 TO 24
280
    READ D
    FOR I = D TO D + 7168 STEP
    1024
300
    POKE H1TBL + M1, I - INT (I
     / 256) * 256
     POKE H2TBL + M1, INT (I / 2
310
320 M1 = M1 + 1
```

```
330 NEXT I
340 NEXT T
350 DATA 8192,8320,8448,8576,8
    704,8832,8960,9088,8232,8360
    ,8488,8616,8744,8872,9000,91
    28,8272,8400,8528,8656,8784,
    8912,9040,9168
360 FOR T = 192 TO 255
370 POKE H1TBL + T,0: POKE H2TB
    L + T,96
380 NEXT T
390 RETURN
400 SHAPETBL = 23040
410 FOR T = 1 TO 241
420 READ D
430 POKE SHAPETBL + T,D
440 NEXT T
450
     RETURN
    DATA 17,64,0,64,0,96,1,64,
    0,112,3,96,1,120,7,112,3,124
     15, 120, 7, 124, 15, 126, 31, 127,
    63,64,0,64,0,0,0,0,0
470 DATA 9,124,3,126,7,127,15,
    127, 15, 126, 7, 32, 0, 32, 0, 0, 0, 0
480 DATA 10,0,6,0,15,64,31,96,
    31,96,63,112,63,120,63,126,6
    3,0,0,0,0
490 DATA
          14,64,15,120,31,120,3
    1,120,31,124,31,126,31,127,3
    1,127,63,127,127,127,127,127
    ,127,127,127,0,0,0,0
500 DATA 11,6,0,30,0,62,0,14,0
    ,2,0,2,0,2,0,2,0,2,0,0,0,0,0
510 DATA 9,64,3,64,3,64,31,127
    ,31,127,79,4,38,127,31,0,0,0
    , Ø
520
    DATA 18,16,0,16,0,80,0,112
    ,1,112,3,120,7,124,15,126,31
    ,127,63,70,24,70,24,126,31,7
    0,25,70,25,126,25,126,25,0,0
    ,0,0
530
          14,64,64,64,112,64,12
    DATA
    4,64,127,96,127,120,127,126,
    127, 127, 127, 102, 32, 102, 32, 10
    2,32,126,127,0,0,0,0
540 DATA 14,1,0,7,0,31,0,127,0
    ,127,3,127,15,127,63,127,127
    ,24,36,24,36,24,60,127,63,0,
    0,0,0
550 GOTO 600
    FOR T = 1 TO DEN
560
    POKE BASE + RND (1) * (R +
    S).M
580 IF Q = 1 THEN S = S - 30
590 NEXT T: RETURN
600 M = 55:R = 5888:BASE = 16384
    :Q = 1: GOSUB 560
610 S = 0:M = 76:BASE = BASE + 1
    200:R = R - 1200: GOSUB 560
620 Q = 0:S = 0:M = 36:BASE = BA
```

```
SE + 1200:R = R - 1200: GOSUB
   560
630 M = 1:BASE = BASE + 1200:R =
    R - 1200: GOSUB 560
640
    RETURN
    FOR T = 1 TO 30: POKE 16384
     + INT (5888 * RND (1)) +
    1,SH1
660
    NEXT T
670
    RETURN
680
    REM LOAD TABLE
690
    GOSUB 100
700
    GOSUB 170
710
    GOSUB 260
    GOSUB 400
720
730
     GOSUB 1090
740
    GOSUB 550
750
    HOME : TEXT : HGR
    PRINT "PRESS THE SPACEBAR T
760
    O BEGIN"
770
     POKE 49168,0
780
     IF PEEK (49152) < > 160 THEN
     GOTO 780
790
    PRINT "SKI LEVEL = ";L;" L
    IVES REMAINING "; LIVES: IF Q
     = 1 THEN 810
800
    CALL BEGIN: Q = 1: GOTO 820
    CALL CNT
810
     IF
         PEEK (23825) = 0 THEN GOTO
    860
    PRINT : PRINT : PRINT : PRINT
830
    "OUCH!!!": FOR T = 1 TO 1000
    : NEXT T
840 LIVES = LIVES - 1: IF LIVES =
    Ø THEN PRINT "GAME OVER, PLE
   ASE WAIT": CALL ERASE: GOTO
    1020
850
    GOTO 790
    PRINT : PRINT : PRINT : PRINT
    :L = L + 1: PRINT "ADVANCING
     TO LEVEL ":L
    IF L = 3 THEN SH1 = 128: GOSUB
870
   650
880
    IF L = 4 THEN SH1 = 147: GOSUB
   650
    IF L > 4 THEN GOTO 930
900 DEN = 25
910 GOSUB 600
920
    GOSUB 100
930
    FOR T = 22528 TO 22528 + 22
    Ø: POKE T,Ø: NEXT T
    IF YP < 95 THEN YP = YP + 1
    5: POKE YSKILOC, YP
950
    POKE 23825,1
960 Q = 0
970 POKE 49168,0
    PRINT "PRESS SPACEBAR TO CO
   NTINUE"
    IF PEEK (49152) < > 160 THEN
   990
1000 HGR
1010
     GOTO 790
     FOR T = 0 TO 220: POKE 225
1020
   28 + T, Ø: NEXT T
     CALL ERASE
1040
     GOSUB 100
1050 DEN = 100
     GOSUB 600
1070 LIVES = 5:L = 1:YP = 35: POKE
    YSKILOC, YP
```

```
1080
      GOTO 750
1090
      FOR T = 23888 TO 23888 + 6
    68
1100
      READ D
      POKE T, D
1110
1120 NEXT T
1130 RETURN
1140 DATA 169,0,141,7,93,141,8
    ,93,133,62,169,88,133,63,169
     ,64,133,65,173,19,93,141,12,
     93,169,20,141,13,93,169,1,14
     1,17,93,160,0,140,1,93,140,2
1150 DATA 93,140,3,93,140,4,93
     ,140,5,93,140,6,93,140,14,93
     140,15,93,140,16,93,140,10,
     93,140,9,93,140,11,93,132,64
     ,96,160,0,24,174,11,93,189
-1160 DATA
            200,89,170,141,4,93,
    32,174,93,76,189,93,24,189,0
     ,91,133,60,189,0,92,133,61,1
    42,2,93,96,192,20,240,41,177
     ,62,201,0,208,78,200,76,189,
    93
1170 DATA 0,2,4,6,8,10,12,14,1
    6,18,20,22,24,26,28,30,32,34
     ,36,38,0,20,40,60,80,100,120
     ,140,160,180,200,56,172,11,9
    3,185,200,89,233,2,153
            200,89,24,165,62,105
1180
      DATA
     ,20,133,62,238,11,93,173,11,
    93,201,11,240,5,160,0,76,155
     93,169,0,141,11,93,133,62,1
    68,96,141,1,93,140,5,93,185,
    203
1190 DATA 93,168,140,3,93,174,
    1,93,189,0,90,141,16,93,232,
    189,0,90,145,60,232,200,189,
    0,90,145,60,142,1,93,174,2,9
    3,232,32,174,93,174,1,93,232
1200 DATA 172,3,93,238,9,93,17
    3,9,93,205,16,93,208,216,169
     ,0,141,9,93,172,5,93,200,173
     4,93,170,32,174,93,76,189,9
    3,169,0,141,8,93,172,7,93
1210 DATA 169,170,153,200,89,2
    38,7,93,173,7,93,201,11,240,
     1,96,169,0,141,7,93,96,172,7
     93,185,223,93,168,140,6,93,
    160,0,177,64,172,6,93,145,62
1220 DATA 200,230,64,240,13,23
    8,10,93,173,10,93,201,20,240
     15,76,140,94,24,230,65,165,
    65,201,88,240,11,76,157,94,1
    69,0,141,10,93,76,179,95,169
     ,0,141
1230 DATA
            17,93,96,174,12,93,3
    2,174,93,165,60,133,66,165,6
     1,133,67,96,173,0,192,201,20
    2,240,61,201,204,240,75,162,
    0,169,32,141,14,93,172,13,93
     ,136,169
      DATA 0,145,66,189,0,89,20
    0,189,0,89,145,66,232,200,18
    9,0,89,145,66,200,169,0,145,
    66, 136, 136, 138, 72, 238, 12, 93,
    32,196,94,104,170,232,236,14
                      continued on next page
```

,93,240	
1250 DATA 41,76,229,94,173,13, 93,240,194,206,13,93,162,32, 169,64,141,14,93,76,229,94,1	
73,13,93,201,38,240,174,238, 13,93,162,64,169,96,141,14,9 3,76,229	
1260 DATA 94,173,18,93,208,34, 173,14,93,201,128,240,56,172 ,13,93,173,12,93,105,1,170,3 2,174,93,173,19,93,141,12,93 ,177,60,208,14,200,177,60,20 8,9,173	
1270 DATA 19,93,141,12,93,76,1 58,95,169,128,141,14,93,169, 0,145,60,136,145,60,32,196,9 4,162,96,76,229,94,169,32,14 1,14,93,173,19,93,141,12,93, 169,1	
1280 DATA 141,18,93,96,32,80,9 3,32,155,93,32,196,94,76,211 ,94,238,8,93,173,18,93,208,2 2,173,8,93,201,9,240,3,76,14 9,95,76,133,94,32,103,94,76	
1290 DATA 149,95,76,158,95,238 ,15,93,173,15,93,201,16,240, 3,76,166,95,169,0,141,18,93, 141,15,93,76,166,95,169,64,1 33,61,169,0,133,60,160,0,145	
1300 DATA 200,208,251,230,61,1 65,61,201,88,208,237,96,0	
TVDO II TADI E	

TYPO II TABLE

Code	Line#	Code	Line#	Code	Line#
RU	10	JZ	30	CO	60
EN	20	NU	40	NJ	70
XN	25	TK	50	FU	80

KL 420 WU 830 MP 124	YOKRXMSUGELDMPSCNURGERTFHJQMMOXMUES	90 100 110 120 110 110 110 110 110 110 11	MI IJ GF SQ XR IJ FS GI TK SS ZY JF GW WU XM YH YG XS IC YJ XX IC YJ XX IC YY XX IC YY XX IC YY XX IC YY XX IC YY YY IC Y IC YY IC IC Y IC Y IC IC Y IC Y IC Y IC IC Y IC Y IC Y IC Y IC Y IC Y IC IC Y IC IC Y IC I I I I	650 670 680 700 710 720 730 740 750 760 780 790 800	XMXIMGREW YESPUD BEXTON SELECTION OF THE	920 930 940 950 950 960 100 100 100 100 100 100 100 110 111 111 111 111 111 112 112
	PO FX LM GV DE QS	360 370 380 390 400 410	XE YI LY GM CE	770 780 790 800 810 820	WB TA TJ FB ZL PZ	118 119 120 121 122 123

Total checksum = 11809314

BASIC GRAPH

Article on page 48

10	REM * BASICGRAPH
20	REM * BY WILLIAM U R SMITH
30	REM * (C) 1985 WILLIAM U R
	SMITH
40	REM * II COMPUTING VOL.1 N
	0.3
50	LOMEM: 16384
60	PRINT CHR\$ (27) + CHR\$ (17
70	GOTO 3000
80	GOTO 4000
	REM * PLOTTER
110	ON PL GOTO 200,210,220,230,
	240,250,260
115	HCOLOR= Ø: HPLOT X1, Y1 TO X

225 HCOLOR= 0: HPLOT X1, Y1: RETURN	32
	1035 IF C < 1 OR C > 60 THEN GOSUB
230 HCOLOR= CO: HPLOT X1,Y1	360: GOTO 1050
235 HCOLOR= Ø: HPLOT X1 + 1,Y1:	1040 GOSUB 300
HPLOT X1 + 2, Y1: RETURN	1050 NEXT LO
240 HCOLOR= CO: HPLOT X1, Y1: HPLOT	1060 RETURN
X1 + 2, Y1	2000 REM * PIE CHART
245 HCOLOR= Ø: HPLOT X1 + 1,Y1:	2005 IF SF < > 0 THEN GOSUB 2
RETURN	700
250 HCOLOR= CO: HPLOT X1,Y1: HPLOT X1 + 1,Y1	2006 SF = 1
255 HCOLOR= 0: HPLOT X1 + 2,Y1:	2010 T = 0
RETURN RETURN	2020 FOR I = 1 TO NE
260 HCOLOR= CO: HPLOT X1, Y1: HPLOT	2025 IF $D(I) < 0$ THEN $A(I) = T$:
X1 + 1, Y1: HPLOT X1 + 2, Y1	GOTO 2040
265 RETURN	2030 T = T + D(I):A(I) = T
300 REM * OUTPUT CHAR	2040 NEXT
305 X1 = ((VX - 1) * 4) + 1	2050
310 FOR LX = 1 TO 5	2100 B(I) = A(I) / T
320 PL = VAL (MID\$ (C\$(C),LX,1)	2110 C(I) = (B(I - 1) + B(I)) /
))	2
330 Y1 = $((VY - 1) * B) + 1 + LX$	2120 NEXT
	2130 C(NE) = 100
340 GOSUB 100	2140 REM
350 NEXT	2150 HCOLOR= CO
$360 \ UX = UX + 1$	2160 R = 40:CX = 185:CY = 80
390 RETURN 400 REM * DATA	2170 :
405 DATA 00000	220 N = 0
409 REM * START AT ! THRU]	2230 PX = CX + R + 10
410 DATA 22202,55000,25052,2767	2240 V = 1
2,51245	2250 N = N + 1
411 DATA 24257,22000,12221,2111	2260 IF (2 ^ (N - 1) > R) DR (R
2,27225	> = 2 ^ N) THEN 2250 2265 REM \$\$J 16384
412 DATA 02720,00212,00700,0003	2270 RD = 2 ^ (- N)
3,11244	2280 CS = COS (RD):SN = SIN (R
413 DATA 75557,22222,71747,7171	D)
7,55711	2290 X = .5:Y = R + .5
414 DATA 74717,44757,71111,7575	2300 FOR N = RD TO 6.3 STEP RD
7,75711	2310 IF N > 6.3 / 2 THEN PX = C
415 DATA 22022,22024,12421,0707	X - R - 10
0,42124 416 DATA 71202,35742	2320 IF N / 6.3 > C(V) THEN GOSUB
420 DATA 25755,65656,34443,6555	2440
6,74747	2330 IF N / 6.29 < B(V) THEN 23
430 DATA 74744,74757,55755,7222	70 2340 U = U + 1
7,11157	2350 HPLOT CX,CY TO CX + X,CY +
440 DATA 56465,44447,77555,5777	Y
5,25552	2360 GOTO 2380
450 DATA 75744,25577,75655,3421	2370 HPLOT CX + X,CY + Y
6,72222	2380 X2 = X * CS + Y * SN
460 DATA 55557,55552,55577,5522	2390 Y = Y * CS - X * SN
5,55711 470 DATA 71247	2400 X = X2
480 DATA 74447,44211,71117	2410 NEXT
500 REM * INIT ROUTINE	2420 B(NE) = 100
505 DIM C\$(60): FOR X = 0 TO 60	2430 RETURN 2440 REM
	2450 C(V) = 100
510 READ C\$(X)	2460 X3 = CX + X + INT (X / 5):
520 NEXT X	Y3 = CY + Y + INT (Y / 5)
525 UX = 1:UY = 1	2470 HPLOT CX + X,CY + Y TO X3,
527 CO = 3	Y3
530 DIM A\$(16),A(17),B(17),C(17	2480 HPLOT TO PX, Y3
),0(17)	2500 OS = LEFTS (AS(V) + "
540 RETURN	",10)
1000 REM * HIRES CHARACTERS 1010 DL = LEN (D\$)	2510 UX = 2 + INT (PX / 4):UY =
1015 IF OL = 0 THEN RETURN	1 + INT (Y3 / B)
1020 FOR LO = 1 TO OL	2515 IF PX < CX THEN UX = UX -
1030 C = ASC (MID\$ (O\$,LO,1)) -	9:05 = RIGHTS (" " + A\$(V),8) continued on next page
	+ A\$(V), B) continued on next page

2520 GOSUB 1000	5,T + 150
2530 HCOLOR= CO	4050 NEXT
2590 RETURN	4065 HCOLOR='0
2700 REM * CLEAR GRAPH	4070 FOR T = 1 TO 5
2710 HCOLOR= 0	4080 HPLOT X1,T + 150 TO X1 + 4
2720 FOR Y1 = 9 TO 143	5,T + 150
2730 HPLOT 100,Y1 TO 278,Y1 2740 NEXT	4090 NEXT 4100 IF PEEK (- 16384) < 128 THEN
2750 HCOLOR= CO:SF = 0	4100 IF PEEK (- 16384) < 128 THEN 4020
2760 RETURN	4110 GET A\$
2800 REM * PLACE TITLE	4120 IF AS = CHR\$ (13) THEN 42
2810 UX = 4:UY = EN + 2	00 11 HJ CINCO (13) INEN IE
2820 OS = LEFTS (AS(EN), 10)	4130 MO = MO + 1: IF MO > 4 THEN
2830 GOSUB 1000	MD = 1
2840 RETURN	4140 GOTO 4020
2900 :	4200 ON MO GOSUB 4800,6000,7000
2910 UX = 17:UY = EN + 2	,8000
2920 O\$ = STR\$ (INT (D(EN)))	4210 GOTO 4130
2930 O\$ = RIGHT\$ (" " +	4300 REM * DISK OUTPUT
0\$,8)	4310 HOME
2940 GOSUB 1000	4320 POKE - 16298,0: POKE - 1
2950 RETURN	6303,0
3000 REM * SET UP SCREEN	4325 PRINT
3005 HOME : HGR	4330 PRINT CHR\$ (4); "CATALOG"
3006 GOSUB 500	4340 PRINT : INPUT "SAVE TO FIL
3007 UTAB 23: PRINT " BY - WM U	E NAME : "; AS
R SMITH"	4350 IF AS = "" THEN 4460
3010 HCOLOR= CO	4360 PRINT CHR\$ (4); "OPEN "; A\$
3020 HPLOT 0,0 TO 279,0 3030 HPLOT 279,0 TO 279,159	HOZO DRINT CURC (H) BURITE B A
3040 HPLOT 279,159 TO 0,159	4370 PRINT CHR\$ (4); "WRITE "; A
3050 HPLOT 0,159 TO 0,0	\$ 4375 PRINT NE
3060 HPLOT 0,8 TO 279,8	4380 FOR X = 1 TO 16
	4390 PRINT A\$(X)
3070 HPLOT 10,8 TO 10,143	4400 PRINT D(X)
3080 HPLOT 99,8 TO 99,143 3090 HPLOT 60,8 TO 60,143	4410 NEXT
3100 HPLOT 10,16 TO 99,16	4440 PRINT SF
3110 HPLOT 0,144 TO 279,144	4450 PRINT CHR\$ (4); "CLOSE"
3150 O\$ = "DISK I/O": VX = 10: VY =	4460 POKE - 16297,0: POKE - 1
19: GOSUB 1000	6304,0
3160 O\$ = "EDIT TITLES": VX = 25:	4470 RETURN
VY = 19: GOSUB 1000	4500 REM * DISK INPUT
3170 O\$ = "EDIT VALUES": VX = 40:	4510 HOME : POKE - 16298,0: POKE
VY = 19: GOSUB 1000	- 16303,0
3180 O\$ = "DRAW GRAPH": UX = 55: U	4515 ONERR GOTO 4620
Y = 19: GOSUB 1000	4520 PRINT : PRINT CHR\$ (4); "C
3200 O\$ = "BASIC GRAPH": VX = 40:	ATALOG"
VY = 1	4530 PRINT : INPUT "FILE NAME T
3210 GOSUB 1010	O LOAD : ";A\$ 4535
3220 O\$ = "TITLE": UX = 5: UY = 2:	4535 IF A\$ = "" THEN 4600 4538 REM
GOSUB 1010	4540 PRINT CHR\$ (4); "OPEN "; A\$
3230 O\$ = "AMOUNT":VX = 18:VY = 2: GOSUB 1010	1316 IKINI CIKA (13, BIEN , AS
3240 FOR Z = 1 TO 16	4550 PRINT CHR\$ (4); "READ "; A\$
3250 O\$ = RIGHT\$ (" " + SIR\$	1330 IKINI CIKA (17, KEIIZ , 112
(Z),2)	4555 INPUT NE
3260 UX = 1:UY = Z + 2: GOSUB 10	4560 FOR X = 1 TO 16: INPUT A\$(
10	X): INPUT D(X): NEXT
3270 NEXT	4580 INPUT SF
3275 HCOLOR= CO	4590 PRINT CHR\$ (4); "CLOSE"
3280 FOR Z = 24 TO 143 STEP 8	4595 POKE 216,0: GOTO 5500
3290 HPLOT 10,2 TO 99,2	4600 POKE - 16297,0: POKE - 1
3300 NEXT	6304,0
3310 HOME	4610 RETURN
4000 REM * SELECT OPTIONS	4620 POKE 216,0: PRINT CHR\$ (4
4010 MD = 2); "CLOSE"
4020 X1 = (M0 * 15 * 4) - 25	4630 GOSUB 4600: GOTO 4000
4025 HCOLOR= CO	4800 REM * FILE I/O
4030 FOR T = 1 TO 5	4810 HOME : UTAB 21
4040 HPLOT X1,T + 150 TO X1 + 4	4820 PRINT "1 - LOAD 2 - SAVE

62

```
3 - CLEAR";: GET AS: PRINT
                                             7050 IF A$ = "" THEN 7080
4830 X = VAL (A$): ON X GOSUB 4
                                              7060 D(EN) = VAL (A$)
    500,4300,5000
                                             7070 GOSUB 7100: GOSUB 2900
4840 HOME : RETURN
                                              7080 NEXT
5000 REM * RESTART
                                              7085
                                                   HOME
5010 HOME : UTAB 21: PRINT "PRE
                                              7090
                                                   RETURN
    SS 'Y' TO CLEAR"; : GET AS: PRINT
                                              7100
                                                   FOR X = 1 TO 5
    : HOME
                                             7110 HCOLOR= 0
5020 IF A$ < > "Y" THEN RETURN
                                             7120 HPLOT 61,X + 9 + (EN * 8) TO
                                                  98.X + 9 + (EN * 8)
5030 FOR EN = 1 TO NE
                                             7130 NEXT
5040 GOSUB 6100: GOSUB 7100
                                             7140 RETURN
5045 D(EN) = 0:A$(EN) = ""
                                             8000 REM * GRAPH DATA
                                             8010 IF NE < 3 THEN RETURN
8020 HOME : UTAB 21
8030 PRINT "1 - PIE CHART
5050 NEXT
     IF SF < > Ø THEN GOSUB 2
5060
    700
5070 NE = 0:EN = 0
                                                   - BAR GRAPH";: GET AS
                                             8035 HOME
5080 RETURN
5500 REM * REDRAW SCREEN
                                             8040 PRINT : X = VAL (A$): ON X
5505 GOSUB 4600
                                                  GOTO 2000,9000
5510 ON SF GOSUB 2000,9000
                                             8050 RETURN
5550 FOR EN = 1 TO 16
                                             9000 REM * BAR GRAPH
                                             9005 IF SF < > 0 THEN GOSUB 2
5555 GOSUB 6100: GOSUB 7100
     IF A\$(EN) = "" THEN 5570
5557
                                                 700
                                             9006 SF = 2: HCOLOR= CO
5560 GOSUB 2800: GOSUB 2900
5570
     NEXT
                                             9010 M = 1
5580
     RETURN
                                              9020 FOR X = 1 TO NE - 1
6000
     REM * EDIT TITLES
                                              9030 IF D(X) > M THEN M = D(X)
6010 EN = 1
                                              9040
                                                   NEXT
6020 HOME : VIAB 20
                                             9060 SZ =
                                                         INT (120 / (NE - 1))
                                             9070 SP = INT (SZ * .3)
9080 SZ = INT (SZ * .7)
6030 PRINT "EDIT TITLES": PRINT
6040 UTAB 22: PRINT EN; " - "; : HTAB
                                              9090 HPLOT 140,20 TO 140,126
    6: PRINT AS(EN)
                                             9100 HPLOT 140,126 TO 270,126
6045 VTAB 22: HTAB 6: INPUT "";
                                             9110 XB = 150
    AS
                                             9120 FOR X = 1 TO NE - 1
6050 IF A$ < > "" THEN 6060
                                             9130 H = INT ((D(X) / M) * 96)
6055
     IF A$(EN) < > "" THEN 607
                                              9135 IF H < - 18 THEN H = - 1
6057 \text{ NE} = \text{EN}: \text{HOME} : \text{B(NE)} = 1: \text{GOTO}
                                             9140
                                                   FOR Y = 1 TO SZ
                                              9150 HPLOT XB, 125 TO XB, 125 - H
    6200
6060 IF A$ = "." THEN 6057
6065 A$(EN) = A$: GOSUB 6100: GOSUB
                                             9160 XB = XB + 1
    2800
                                              9170 NEXT
6070 EN = EN + 1: IF EN < 17 THEN
                                              9180 XB = XB + SP
                                              9190 NEXT
    6020
                                              9200 REM LABEL Y AXIS
6080 HOME : GOTO 6057
                                              9300 FOR X = 4 TO 1 STEP - 1
6100 FOR X = 1 TO 5
                                              9310 Y = INT (M * (X / 4))
6105 HCOLOR= 0
                                              9320 \, Os = RIGHTs ("
6110 HPLOT 11,X + 9 + (EN * 8) TO
                                                   STR$ (Y),8)
    59, X + 9 + (EN * 8)
                                              9330 \ VX = 26: VY = 4 + (12 - X *
6120 NEXT
                                                  3): GOSUB 1000
6130 RETURN
6200 IF NE = 17 THEN RETURN
                                              9350 NEXT
                                              9360 Z = INT ((SZ + SP) / 4)
6205 FOR EN = NE TO 16
                                              9362 T = \emptyset: VY = 17
                  > "" THEN AS(
6210 IF A$(EN) <
                                              9365 IF Z < 4 THEN Z = Z + Z:T =
    EN) = "": GOSUB 6100:D(EN) =
                                                  1: VY = 16
    0: GOSUB 7100
                                              9370 Z = Z - 1
6230 NEXT
                                              9380 FOR X = 1 TO NE - 1
6240 RETURN
                                              9385 UY = UY + T: IF UY > 18 THEN
7000 REM * EDIT VALUES
                                                  UY = 17
7005
     FOR EN = 1 TO NE -1
                                              9390 Y = 150 + ((X - 1) * (SZ +
7020 HOME : UTAB 20
                                                  SP))
7030 PRINT "EDIT VALUES: PRINT
                                              9400 \ UX = INT (Y / 4) + 1
                           "; LEFT$
",1
7040 UTAB 22: PRINT EN;"
                                              9405 IF Z < 3 THEN OS = STRS (
    (AS(EN) + "
                                                 X): GOTO 9415
    1);" - ";: HTAB 18: PRINT D(
                                              9410 OS = LEFTS (AS(X) + "
    END
                                                  ",Z)
7045 VTAB 22: HTAB 18: INPUT ""
                                                                    continued on next page
```

FEBRUARY / MARCH 1986

9415 IF D(X) > 0 THEN GOSUB 10 00 9420 NEXT 9500 RETURN

TYPO II TABLE

Code	Line#	Code	Line#	Code	Line#
ABPZYCRTPJFGJGJKYYGGJGJRGZKRZIXFFGLBCFCJKKFZGKKBGCHCGKKBJGZ	10000000001115050505050505050500000000590112345600000050057	R O O B O O O O O O O O O O O O O O O O	530 000 101 1033 1040 105	OGTGKJVRFBGGKPGGCABDGGGBXNTGGNPKCJENNONUTGGGJPKIFAXFIAVNTUXI	255300000000000000000000000000000000000

OC N M G R A A K V B G M B G I J A V G F X K V D G H J L C W O J U F G N J T A V V XX S C D J F Y A V V	55555555555555555566666666666666666666	JI WF GU SM UC RR FU GU BG SM YQ WS FA YC YY AG PH	7140 8000 8010 8020 8030 8035 8040 9005 9006 9010 9020 9040 9040 9060 9080
00050000000000000000000000000000000000	#050 RC FZ RM GC FZ R	4050 RC 5010 4065 FZ 5020 4070 RM 5030 4080 KQ 5040 4090 FR 5045 4100 FA 5050 4110 GA 5060 4120 MK 5070 4130 GV 5080 4140 XB 5500 4200 HQ 5555 4310 KQ 5555 4310 KQ 5555 4320 GI 5557 4330 FA 5560 4330 FA 5570 4340 GV 5580 4370 IX 6020 4410 IX 6050 4410 IX 6050 4410	4050 RC 5010 JI 4065 FZ 5020 WF 4070 RM 5030 FA 4080 KQ 5040 GU 4080 KQ 5045 GU 4080 FR 5045 GU 4100 FA 5050 ZM 4110 GA 5060 UC 4120 MK 5070 RR 4130 GV 5080 FU 4140 XB 55005 GU 4110 XB 55005 GU 4200 HQ 5550 GA 4310 KQ 5555 XM 4320 GI 5555 XM 4330 FA 5570 WS 4340 GU 5580 FA 4370 TX 6020 AG 4370 TX 6020 AG 4370 TX 6020 AG 4370 TX 6020 AG 41400 <
	R F R K F F G M G X H S F K G M F G R C I J M M N G C L L C W C J U F G N L J F G P B I C C G I B L F F	RC 5010 FZ 5030 KQ 5040 FR 50050 FR 50060 FR 500	RC 5010 JI FZ 5020 WF RM 5030 FA KQ 5040 GV FR 5045 GU FR 5050 ZM KQ 5040 FC FA 5050 ZM FA 5050 ZM FA 5050 GC FA 5060 WC FR 5070 FA FA 5050 GA KM 5070 FA FA 5050 GA KM 5070 FA FA 5050 GA KM 5550 FB FB 5550 FA FB 5550 FA FB FB 5555 FA FB

Total checksum = 4514056

HI-RES TO PRINT SHOP CONVERTER

Article on page 32

```
REM * HIRES TO PRINT SHOP C
    ONVERTER
20
   REM * BY JON C THOMASON
        * (C) 1985 ANTIC PUBLIS
   REM
   HING INC.
         * II COMPUTING VOL.1 N
   REM
    0.3
   HOME : TEXT : GOSUB 6000
  POKE 232,0: POKE 233,3
70 XX = 7:YY = 22
   POKE - 16302,0: POKE - 162
   97,0
   FOR X = \emptyset TO B:X(X) = INT (
    X / 3) * 92:Y(X) = (X - INT
    (X / 3) * 3) * 64: NEXT
100
    GOTO 5000
999
    REM * CHOOSE SCREEN PORTIO
1000 TEXT : HOME : UTAB 2: HTAB
    3: PRINT "USE THE I, J, K, A
    ND M KEYS TO MOVE": PRINT : HTAB
    1: PRINT "THE WHITE SQUARE D
    VER THE AREA THAT IS": PRINT
    : HTAB 14: PRINT "TO BE REDU
   CED."
1010 PRINT : HTAB 1: PRINT "PRE
    SS RETURN AFTER YOU HAVE MAD
    E YOUR": PRINT : HTAB 15: PRINT
    "SELECTION."
     PRINT : HTAB 7: INVERSE : PRINT
    "PRESS ANY KEY TO CONTINUE":
     NORMAL
1030 PRINT : HTAB 19: GET A$
1040 POKE - 16297,0: POKE
    6304,0: POKE - 16302,0
1050 ROT= 16: SCALE= 12: POKE 2
    30,32
1060 XDRAW 1 AT XX + 264, YY
1070 GET AS: XDRAW 1 AT XX + 26
1080 IF AS = CHR$ (27) THEN RETURN
1090 IF AS = "I" THEN YY = YY -
    1: IF YY < Ø THEN YY = Ø
1100 IF AS = "J" THEN XX = XX -
    1: IF XX < 0 THEN XX = 0
1110 IF AS = "K" THEN XX = XX +
    1: IF XX > 15 THEN XX = 15
1120 IF AS = "M" THEN YY = YY +
    1: IF YY > 35 THEN YY = 35
1130 IF A$ < > CHR$ (13) THEN
    1060
1140 REM * REDUCE AREA TO 9 BR
    IGHTS
1150 ROT= 0: SCALE= 1: HCOLOR=
    3: HGR2
```

```
1160 FOR Y = 0 TO 51: FOR X = 0
     TO 87
1170 POKE 230,32: XDRAW 2 AT X *
    YY + E * Y, XX + E
     IF PEEK (234) = 9 THEN 12
1180
    00
     FOR B = PEEK (234) TO B: POKE
    230,64: HPLOT X(B) + X,Y(B) +
    Y: NEXT
1200 POKE 230,32: XDRAW 2 AT X *
    YY + E * Y, XX + E
1210 NEXT : NEXT : RETURN
1999 REM * CHOOSE BRIGHTNESS
2000 TEXT : HOME : UTAB 2: HTAB
    1: PRINT "PRESS THE SPACE BA
    R TO MOVE THE WHITE": PRINT
    : HTAB 2: PRINT "SQUARE OVER
     THE BRIGHTNESS YOU WANT": PRINT
    : HTAB 2: PRINT "PRESS THE R
    ETURN KEY AFTER YOU HAVE": PRINT
    : HTAB 12: PRINT "MADE YOUR
   CHOICE"
2010 PRINT : HTAB 7: INVERSE : PRINT
    "PRESS ANY KEY TO CONTINUE":
2020 PRINT : HTAB 19: GET A$
2030 POKE 230,64: ROT= 16: SCALE=
    4:B = 0: POKE - 16304,0: POKE
      16299,0
2040 XDRAW 1 AT X(B) + 88, Y(B)
2050 GET AS: XDRAW 1 AT X(B) +
   88, Y(B)
2060 IF AS = " " THEN B = B + 1
    : IF B = 9 THEN B = 0
2070 IF A$ < > CHR$ (13) THEN
    2040
2080
     REM DIGITIZE & SAVE
2090 TEXT : HOME : UTAB 2: HTAB
    2: PRINT "USE THE SPACE BAR
    TO SELECT BETWEEN": PRINT : HTAB
    1: PRINT "A NORMAL OR AN INV
    ERSE GRAPHIC PICTURE": PRINT
    : HTAB 2: PRINT "PRESS THE R
    ETURN KEY AFTER CHOOSING"
2100 PRINT : HTAB 7: INVERSE : PRINT
    "PRESS ANY KEY TO CONTINUE":
     NORMAL
2110 PRINT : HTAB 19: GET AS
2120 POKE - 16304,0: POKE - 1
   6299,0
2130 XX = INT (B / 3) * 92:YY =
   (B - INT (B / 3) * 3) * 64
2140 ROT= 0: SCALE= 88: FOR X =
   0 TO 51: XDRAW 3 AT XX,YY +
X: NEXT : GET AS: IF AS < >
     CHR$ (13) THEN 2140 continued on next page
```

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```
2150 FOR X = 0 TO 51: XDRAW 3 AT
    XX, YY + X: NEXT
2160 SCALE= 1: FOR X = 0 TO 10:
     FOR Y = \emptyset TO 51
2170 FOR Q = 0 TO 7: XDRAW 3 AT
   XX + X * B + Q, YY + Y
2180 BIT(Q) = PEEK (234) = 0: NEXT
2190 POKE Y * 11 + X + 24576, BI
   T(7) + BIT(6) * 2 + BIT(5) *
    4 + BIT(4) * B + BIT(3) * 16
     + BIT(2) * 32 + BIT(1) * 64
     + BIT(0) * 128
2200 NEXT : NEXT : POKE
                        - 1630
    0,0: POKE - 16303,0: HOME
     INPUT "WHAT WILL YOU CALL
   THIS GRAPHIC ?
   A$
2220 HOME : HTAB 13: PRINT "MOV
    ING IMAGE"
2230 FOR X = 0 TO 574: POKE 225
    28 + X, PEEK (24576 + X): NEXT
2240 HOME : HTAB 12: PRINT "NOW
     SAVING IMAGE"
     PRINT CHR$ (4)"BSAVE"A$",
    A$5800, L575"
2260 RETURN
     REM * LOAD IMAGE
2999
3000 HOME : INPUT "WHAT IS THE
    NAME OF THIS IMAGE? (CR=CAT)
      ==>";A$
3010 ONERR GOTO 5000
     IF NOT LEN (AS) THEN PRINT
     CHR$ (4) "CATALOG": GET AS: GOTO
    BOOR
3030 PRINT CHR$ (4)"BLOAD"A$",
    AB192"
3040
      POKE 216,0
     RETURN
3050
3999 REM * EXIT
4000 HOME : PRINT "DO YOU REALL
    Y WANT TO QUIT NOW? (Y/N) >"
4010 GET AS: PRINT AS; CHRS (8)
4020 IF AS = "Y" THEN TEXT : HOME
    : END
4030 RETURN
4999 REM * TITLE/CREDITS/MENU
5000 TEXT : HOME : PRINT "=====
    _______
5010 PRINT " HIRES TO PRINT SHO
   P CONVERTER "
5020 PRINT " BY JON C THOMASON
5030 PRINT " (C) 1985 ANTIC PUB
    LISHING INC."
5040 PRINT " II COMPUTING VOL.
    1 NO.3"
5050 PRINT "----
5060 PRINT : HTAB 10: PRINT "1)
     REDUCE IMAGE"
5070 PRINT : HTAB 10: PRINT "2)
     SAVE GRAPHIC"
5080 PRINT : HTAB 10: PRINT "3)
```

LOAD SCREEN" 5090 PRINT : HTAB 10: PRINT "4) EXIT" 5100 VTAB 20: HTAB 10: PRINT "Y OUR SELECTION ==>"; 5110 VTAB 20: HTAB 28: GET A\$ 5120 IF NOT VAL (A\$) OR VAL (A\$) > 4 THEN 5110 5130 ON VAL (A\$) GOSUB 1000,20 000,3000,4000 5140 GOTO 5000 5999 REM SHAPE TABLE SETUP 6000 FOR $X = \emptyset$ TO 51: READ Y: POKE 768 + X,Y: NEXT : RETURN 6010 DATA 3,0,8,0,44,0,50,0 6020 DATA 45,45,45,45,45,45,53, 54 6030 DATA 54,54,54,54,54,54, 54 6040 DATA 54,62,63,63,63,63,63, 63 6050 DATA 36,36,36,36,36,36, 6060 DATA 36,36,36,0,45,54,63,4 6070 DATA 6,0,5,0

TYPO II TABLE

Total checksum = 5171529

II ERR IS HUMAN

by Michael J. Biancalana, Technical Assistant

We have received relatively few calls from readers concerning our listings. Here at our editorial offices we run and test all our programs as thoroughly as possible on Apple IIe's before printing them in *II Computing*. Nevertheless, some problems do, on occasion, escape our watchful eyes.

Several readers encountered an "Illegal Quantity Error" in the Comet plotting routine of our **Halley's Comet** program in our October/November issue. Make the following changes to correct this problem:

7015 IF X>277 THEN 6200 6120 YT=159 — Y: IF YT>191 THEN GOSUB 6200 6160 IF YT<191 THEN HPLOT X,YT TO TX,TY 7020 IF I<191 THEN HPLOT X-2,I TO X+2,I 7050 IF I<191 THEN HPLOT X-1,I TO X+1,I DOS 3.3 users who typed in the **Motion Analysis** program from the December/January issue as one listing should make the following changes:

80 PRINT CHR\$(4);"RUN KIN.PART1" 240 REM * AND REMOVE THE REM IN LINE# 80

Save the listing as KIN.PART1.

Also from December/January (Issue 2) the parentheses in Daniel Wolf's Multiplying Big Numbers program printed out as brackets. Be sure to enter them as parentheses.

II Computing invites all our readers to alert us to any possible descrepancies in our listings. And we welcome your suggestions for program enhancements.//

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•	Apple //c Computer (only available with		
	any combination order)	\$940.00	\$750.00
•	Apple //c Computer and //c Monitor		
	and stand (only available with any		
	combination order)	\$995.00	\$850.00
•	256K DRAM Chip (150 NS) (1 each)	\$ 6.25	\$ 2.55

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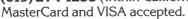
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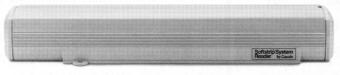
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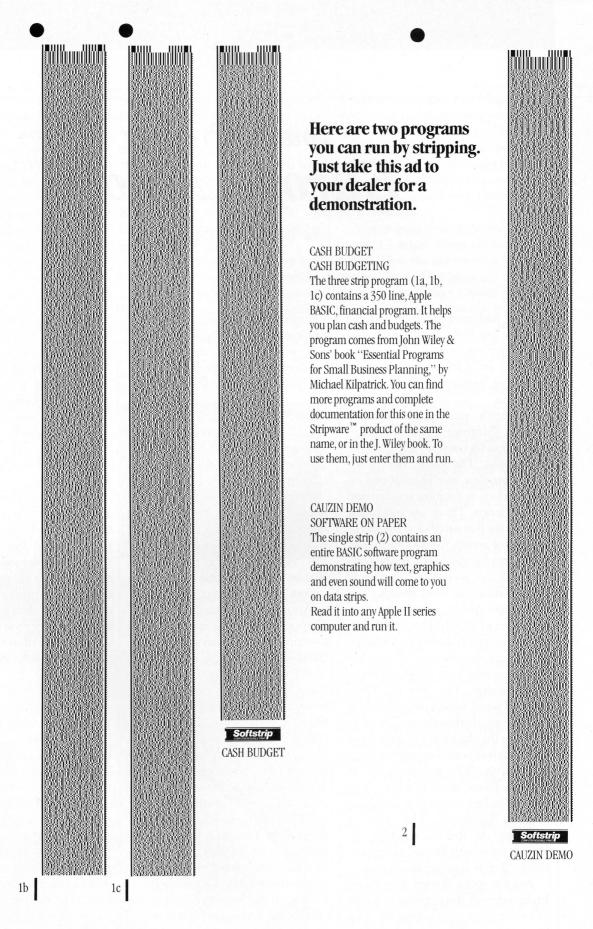
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1a

REVIEWS

Sneak Preview Europe Ablaze

by RICK TEVERBAUGH

"I never had anything to do with the military, but I was always interested in playing war games," said Roger Keating, in a telephone interview from his home in West Ryde, Australia.

Keating's new game Europe Ablaze (Strategic Studies Group) proves that fact beyond any glimmer of a doubt. The game, one of the most complex war simulations on the market, is exciting to play and easy to learn. There are two major reasons for this simplicity: the extensive use of menus for options in both setting up the game and in the playing and the included tutorials (if you're willing to read them).

Europe Ablaze covers the fiveyear period (1940-44) when Europeans experienced overhead warring as a daily occurrence. There are three scenarios from which to choose in the game. The first is "Their Finest Hour," which describes how the German Luftwaffe was trying to conquer the skies but ran into some stiffer-than-expected opposition from the British. The second setup is "Enemy Coast Ahead," where Britain embarked on its first bombing runs of Germany. The third is "Piercing the Reich," in which the British tried with limited success to bomb Berlin into submission.

But the game doesn't stop there. Included with the package is a disk to create your own scenarios. The Game Design Kit includes a 42 by 36 hex grid, 24 aircraft types, 255

squadrons, 127 airbases, 63 cities, 63 radar stations, 63 shipping lanes, 63 flak units, victory determination routines and a weather creation utility. Also included is a fourth scenario of air operations in the Mediterranean in March of 1944. All that's really required is enough general knowledge of the conditions in Europe at the time to create a believable setup.

"We felt that anyone should be able to be put into the position of commander in this game and be able to function in that job," said Keating. "Now he probably wouldn't win. But he should be able to hand out orders and get things done."

Another remarkable aspect of Europe Ablaze is the speed at which the computer calculates all the data. Machine language accounts for that.

"Writing in machine language is like running at a brick wall and bouncing off—and then learning to like it," Keating said. "To actually calculate up to 255 squadrons, keep track of their movement and combat options and results for Europe Ablaze all in nine minutes, the program has to be lightning fast."

There are three ways to play the game. The first (and easiest) is by taking the role of the Commander-in-Chief. By taking that position, you are responsible for getting directives from the Supreme Command (always the computer) and translating them into specific objectives to be relayed to the Air Fleet Com-

mander. Here, the computer takes the Air Fleet Command role.

A second way to accept the challenge is to let the computer handle the Supreme Command role and that of the Commander-in-Chief. That leaves you free to be the Air Fleet Commander. The third option is to take on both jobs as Commander-in-Chief and Air Fleet Commander.

Up to 12 different gamers can play Europe Ablaze at the same time, for there are two Commander-in-Chief positions and five Air Fleet Commanders under each C-in-C. The computer fills whatever roles are left over. The computer also keeps track of the planes, decides combat results, allows for other variants such as the weather and then tabulates victory points to determine who wins at game's end.

One feature of the game that makes it easy to return to is that you're never really in control of the Supreme Command. You're never really free to just go around bombing whoever or whatever you feel like anytime the mood strikes you. There often are more obstacles put in your path by your superiors than by the opposition.

Keating doesn't work alone on his programs. "I was doing the design, development and research," Keating said. "The historical background put into the games was limited by the amount of time I could devote to the research and still get everything

done."

That's why he formed the Strategic Studies Group and linked up with Ian Trout. "Ian is a historical gamer," said Keating. "That gives me time to concentrate on getting the programming done."

As SSG, Keating and Trout have already put together Carriers At War, a naval battle in the Pacific theater of World War II which won the Computer Game of the Year award at Origins, and Reach For the Stars.

"Actually Carriers came out of working on another game we were going to call Task Force South about the Falklands," Keating recalled. "After about three months, we just looked at each other and went down and drank two bottles of red wine. We knew it wasn't going to work so we sat down and just decided exactly what we wanted a computer game to do."

The result was Carriers. This program was one of the first war games to include the "design your-own-scenarios." But it wasn't supposed to be part of the finished product—at least originally. "That came as a mechanism for talking to Ian," said Keating. "It was devised so that he could work with the game and perhaps be able to fine tune it without

having to do any programming himself. Then when the game was finished, it had worked so well, we decided to leave it in."

When questioned about the possibility of creating games that could be construed as glorification of war, Keating had ready answers, as though he'd been through them many times before.

"When you level that charge you have to aim it at everything pertaining to war: books, games, movies. War gaming can be a positive experience, but people need to be very aware of what they're doing," said Keating. "T've read a large amount of data in putting together these games and my eyes have been



EUROPE ABLAZE

opened.

"For instance with Europe Ablaze, I figured if you got shot down you just jumped out and probably parachuted to safety. But I found out that if you got shot down you have only a one in six chance of surviving. Once the plane started spinning toward the ground there was no way to get out. The British air command completely turned over their pilots from 1938-41.

"I get a great deal of pleasure playing and I hope others do too. But I don't think the games have homogenized war. For instance in the "Superpowers" series (When Superpowers Collide, Strategic Simulations, Inc.) I didn't even include nuclear weapons, because they could just be used and the game would be over in a couple of turns."

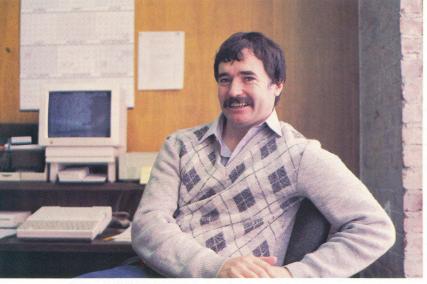
The next Keating-Trout project is a game of the Civil War—the U.S. Civil War, that is. "We're going to work in both the military and political roles," revealed Keating. "For instance you might do real well on the military level, but then the computer might switch you to a political position. You'll need to consider that what might be the right military move, might not be such a good political decision. We're trying to reflect what actually went on in the Civil War."

As with Carriers and Europe Ablaze, the Civil War game will be a 64K program. "Then we'll analyze the market before we decide our next move," said Keating of the decision about what memory restrictions to work within. "We need to have 60 percent of the market with 128K possibility in order to make it advantageous for us."

But exactly what will that extra memory do?

"Well, first of all it will give us a tremendous amount of data space," said Keating. "It will also give us more memory to work with for the computer commanders. We can then program in some emotional characteristics and make the computer take on some very human roles.

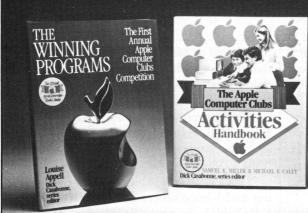
continued on next page



Roger Keating discusses war gaming and future plans

PHOTOGRAPHY BY LINDA TAPSCOTT

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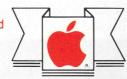
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REVIEWS

"I'm sure we'll take some shots for a couple of Aussies doing a game on your Civil War," laughed Keating. "The computer market is more mature in the states than it is here," he said. "The states are five to 10 years ahead of Australia. The demand for any type of intellectual games is much stronger in the states than it is down here. That's why we are so pleased that our games have been so well received in the United States. Carriers has sold far beyond any of our expectations."

Needless to say, he hopes the same from Europe Ablaze. And there's every reason to believe that success will follow. Keating's games make sense, aren't too difficult to learn and have enough detail to keep you interested through numerous bootings. What else could you ask for?//

Rick Teverbaugh is a newspaper sports writer and former midwest editor for Electronic Games. He frequently reviews computer games.

PRODUCT INFORMATION

EUROPE ABLAZE CARRIERS AT WAR REACH FOR THE STARS Strategic Studies Group US distributor: John Gleason 1747 Orleans Court Walnut Creek, CA 94598 (415) 932-3019 Electronic Arts 2755 Campus Drive San Mateo, CA 94403 (415) 571-7171

48K; \$44.95 (Each game) WHEN SUPERPOWERS COLLIDE (Series) Strategic Simulations, Inc. 883 Stierlin Road, Bldg. A-200 Mountain View, CA 94043 (415) 964-1353 48K (each game) \$59.95 (GERMANY 1985) \$34.95 (All others in series)

ON SARAH WALDRON

The Equalizer

by EDWARD G. BEDDOW

THE EQUALIZER; Schwab Technology Services, 101 Montgomery St., San Francisco, CA 94104; (800) 334-4455; 128K, 2 disk drives recommended, modem; \$199.

If you are among the many investors who use a discount broker to save on commission costs when buying and selling securities, you know that the search for investment advice can be a difficult and time-consuming task. Discount brokers neither provide their clients with research information nor make recommendations as to which securities to buy or sell.

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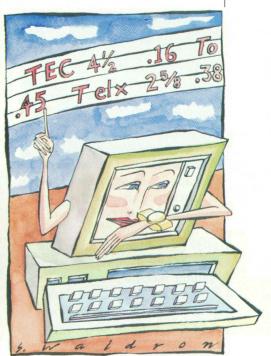
communications parameters such as a password and an ID (supplied by Schwab) and the user's choice of a network (either Telenet or Tymnet) local access number.

The research module provides a convenient all-in-one means of accessing several of the most useful business and investment databases. I had some initial difficulty establishing a connection with Tymnet using the Apple modem, but turning off switch #2 seemed to solve the problem. Once you are connected, obtaining information is a breeze, although finding your way around the different services requires some practice.

The individual company profiles contain a wealth of well-organized and useful information extracted from four separate databases. In addition, charts of stock prices and trading volume for the last year are included.

Investors should especially value the forecast of earnings per share provided by Institutional Brokers Estimate System, which gives the consensus estimate of all analysts who follow the company. Unfortunately, you can only retrieve one report at a time (the call terminates automatically after all data is received) and the information cannot be saved to disk.

DJ Quotes gives the user quotations up to five securities at a time. Additional blocks of five quotes can readily be obtained since the service



does not terminate until the user hits ESC.

Dow Jones News/Retrieval service offers access to over 35 informational services, including quotes, financial news, Merrill Lynch research, the Official Airline Guide and electronic mail, just to name a few.

Standard and Poor's Marketscope, which competes with Dow Jones, incorporates analysts' recommendations and commentaries on securities of current interest, highlights major business news items as they occur, provides hourly progress reports on the financial markets throughout the day, and includes useful information for bond investors.

continued on page 79

Roundup of Financial Software

by ANITA MALNIG, Associate Editor

None of us like paying bills...or reconciling checkbooks. But neither do we like the feeling of our money slipping through our fingers. "I had \$100 two days ago—where did it go?" Most folks want to keep better track of this elusive commodity.

Theoretically, the computer has the capacity to help us with all this. It remembers, does math accurately and doesn't mind boring, rote jobs. So why are many of us still shying away from financial programs?

Part of the reason is that you must commit thought, time and persistence to the job at hand. You have to want to set up a budget; you have to be able to see the long-range value of it and you must have the discipline to keep the budget up-to-date.

Certainly, you deserve programs that make the process as painless as possible. The technology should be quick and easy, and should guide you through each step of the budget process. The documentation should complement, not replace, on-screen instructions and offer explanations of the budgeting process, such as definitions of terms and how all the pieces of the puzzle fit together.

Several of the programs reviewed here require 128K, which is fine. Developers are making better use of available technology. However, publishers must display this fact much more prominently on the packaging. Also, while all of these programs function with one disk drive, the amount of disk-swapping required

makes paper, pencil and calculator faster. Do not use any of these programs with one disk drive. Programs that are DOS 3.3-based tend to be slower. And while it is commendable to have a program requiring 48K in order to reach many Apple users, I've come to think that budget programs should use the best technology. Speed, no disk-swapping, and more memory help move the tasks along.

The programs covered here set out to do several things: make up budgets, balance checking accounts and prepare tax papers.

Your Personal Net Worth (Scarborough Systems) lets you keep track of all your accounts - checking, savings and credit card—and properly transfer the payments from one account to another. It also has a checking account balancer with check-writing and printing facility and helps you keep track of tax deductible items. You must read the documentation thoroughly before you begin, and since the program assigns numbers to each type of entry, you must refer to it at all times for the correct numbers. While there is a help menu on-screen, it will help only when you have a fairly complete understanding of the mechanisms of the program. Just about all the entry screens are the same format, so the trick is knowing what to put into them. The writing valiantly attempts to be clear and to use a step-by-step approach. But a paragraph that's called "Getting Ready to Get Started" forbodes confusion, I think. The documentation gets too detailed right away, thus clouding up an already intimidating task.

However, once you work out the initial bumps, you'll find this a straightforward program than can keep track of your funds, down to the last penny. In fact, it may be more program than you'll actually need.

Basic Accounting a program from Practical Peripherals, Inc. requires less memory than Personal Net Worth but is less sophisticated in approach (i.e., a 40-column screen, slow disk access time, DOS 3.3 operating system, and eternal disk swapping with one drive). There is a lot of pre-preparation to set up your disks and the system, and it is essential to read the documentation as you go along. I'm one of those folks who likes to boot up a disk, and take an electronic "walk" through the program. Not possible here. The program crashed several times before I went back to the documentation and discovered all the preliminary things I had to do. The manual is clearly written but does not offer either an introductory overview or any sample files to experiment with. To its credit, the program offers password protection, will print checks, reports and bar graphs, handles an unlimited number of accounts and lets you transfer DIF files from other programs.

The fastidious folks should consider The Home Accountant by Arrays, Inc. It will do the job, and more, but you must expect to spend several hours a week feeding it data. All transactions—including credit card and cash-to and from all sources should be entered to make the program work correctly. If you do, your payoff will be a current assessment of your net worthincluding appreciating equities, status of your checkbooks (up to five) and various accounts, budget analysis and projections for up to 100 categories, as well as a variety of reports including activity, budget, balance sheet and expense by category. The program prints checks, with regular ones each month if you wish, and it reminds you of bills due and other timely requirements. A monthly calendar to the year 2000 and memo pad are thoughtful accessories.

And then there is that time of year everyone dreads, tax time, when your regular service at the altar of The Home Accountant is further rewarded. Its data is fully compatible with the company's program, The Tax Advantage, which is reissued each year to match any new IRS requirements. (You must pay extra for this reissue.) You can also use The Tax Advantage by itself. Either way there is no guarantee that you have done your taxes correctly or availed yourself of all legal opportunities. For the most part, it is a formatter and calculator for required IRS items. The 1985 version for the 1984 tax year included Form 1040, Schedules A, B, C, D, E, G, SE, and W and Forms 4562, 2441, 2106, and 6251. If you do use it and The Home Accountant while preparing your taxes, the cost of both programs is deductible.

The budget program I found most immediately accessible (but perhaps not the most thorough) was **MouseBudget** from International Solutions, Inc. This obviously uses a Mouse to pull down windows, each representing a different type of transaction, category and so forth. The documentation immediately takes you through a sample tutorial in which you enter and manipulate an imaginary person's accounts. It is extremely helpful (and fun, I might add) to get a feel of the program and get a hands-on definition of terms. However, MouseBudget lacks what others seem to go overboard with: there is no comprehensive overview of the whole accounting process. Also, the manual has no index.

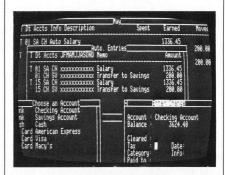
MouseBudget offers only 60 category entries (as opposed to 400+ in Your Personal Net Worth), but for the average person, a small number may be sufficient.

The technology of this program is current, quick and efficient, with visually appealing screens. I think the Mouse is something of a toy/gadget; you need approximately an 8-inch by 10-inch space in which to operate it, and at times it seems not to bring down a window as it is supposed to. Still, the windows are wonderful. You can grasp at a glance what you are working with and how one file fits in with another. Windows speed the process along amazingly—no small advantage.

You can keep track of your checking account but you cannot print out checks; you can also keep track of tax-related deductions. As with the other programs, you must understand the overall concept of assets and liabilities, be aware of what all the information is that you must compile, and sit down and do it. This program is less complete than Your Personal Net Worth and The Home Accountant, but it is eminently more approachable.

Tax preparation programs raise several interesting questions. How many people actually do their own taxes? Why pay for accounting software when you could just as well pay someone else to do the work? You've also got to update your tax software every year (see sidebar for prices).

But, putting aside those considerations, you will find that most tax packages do essentially the same thing. They format the IRS forms, calculate for you as you go along, and allow you to fill in the blanks electronically to try out various alternatives.



MOUSEBUDGET

TaxPak by Ahware is the simplest of those reviewed here. You barely need to read the manual to figure out what to do. However, it's a little slow booting and has a 40-column screen. It also doesn't include as many tax forms as the others here. It includes: Form 1040 and Schedules A, B, C, D, G, SE and W. But these may be all the forms you will need. (The version I looked at was '85 for the 1984 tax year.) The documentation is clear, brief and to the point.

In contrast to this simplicity is The Tax Preparer from Howard-Soft. This program comes in a studious-looking brown plastic 3-ring binder with an unfriendly sticker that warns, "Open me and inspect my manual, but open the disk packet and I'm yours."

However, this tome includes instructions for the many features you'll find in the program. The tax forms included here are Form 1040, Schedules A, B, C, D, E, F, G, R, SE, and W, and Forms 2106, 2119, 2210, 2441, 3468, 3903, 4562, 4797, 5695, and 6251. (1985 versions for

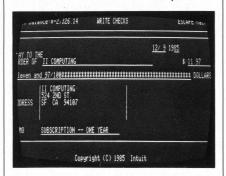
continued on next page

1984 tax year.) But there are also features for the professional tax preparer such as High Volume Returns and detailed explanations of the forms. The information about the forms is helpful but you can get it from the IRS, and any remaining questions will have to be answered by an accountant, if not Uncle Sam. As in the other tax programs, the forms are straightforward and printouts are available.

Now, how about not taking a big bite all at once but starting with some software that may ease you into and make you comfortable with financial programs?

Quicken, from Intuit, is strictly check balancing but with an option that lets you transfer data to the AppleWorks spreadsheet to do with what you will.

You write your checks out on an on-screen check format and you can



QUICKEN

get printed checks as well. The program will remember frequently-written checks so that your mortgage payments, or anything else that's fixed, can be filled out once and simply printed out each subsequent month.

No doubt this will keep tabs on your math and make check reconciling easier. However, the problem with this program—and any other like it—is that you must consistently enter all the checks you write in supermarkets, department stores and so on. If you keep your handwritten register with you and set aside a special time to enter those

transactions, you'll be okay.

A simple, direct program that made me very happy was "The Balancing Act," Work Force II, by Core Concepts. This check-balancing program did not require me to read the manual (except to find out that I should not enter commas in four or more digit numbers). It simply helped me to reconcile my latest bank statement. It neither prints out checks nor remembers the name of your mortgage company. It does ask you such easy-to-answer questions as: "What is your checkbook balance?" "What is your bank statement balance?" "What are the amounts of the checks that are outstanding?" and "What deposits are not shown on your bank statement?" It asks all the right questions, and, if you're lucky, gives you the right answer. If your account doesn't balance, you can go to "The Calculator" program on the same disk and redo all your math. It's up to you to find out if you've omitted a transaction.

"The Loan Analyzer" will also meet some simple but real needs. Suppose you want to finance your second mortgage. You know what you'd like to pay per month in payments and you know how much cash you have on hand. So, how much should you borrow? This handy little program will tell you.

Core Concepts actually has two programs that do such simple, practical tasks. Profit Pursuit analyzes interest rates and profits on leased property, figures out depreciation, for a merchant will calculate pricing and will figure out APR, the actual percentage rate of loans with prepaid discount points. I think \$39.95 apiece is a trifle steep — I'd like to see both products together for that price. However, the programs move quickly; even though they operate with DOS 3.3, they use an Einstein Compiler which translates the program into machine language.//

PRODUCT INFORMATION

YOUR PERSONAL NET WORTH Scarborough Systems, 55 S. Broadway, Tarrytown, NY 10591, (914) 332-4545, 64K; Dos 3.3; \$79.95.

BASIC ACCOUNTING

Firefighter Software, Practical Peripherals, Inc., 31245 La Baya Drive, West Lake Village, CA 91362 (818) 991-8200, \$19.95.

HOME ACCOUNTANT TAX ADVANTAGE

Arrays, Inc., 6711 Valjean Ave., Van Nuys, CA 91406, (818) 994-1899, 48K; ProDOS (both programs); \$74.95, Home Accountant; \$69.95, (update \$35) Tax Advantage.

MOUSEBUDGET

International Solutions, Inc., 901 W. Maude Ave., Sunnyvale, CA 94086, (408) 773-0443, 128K; Pascal-based; \$69.95.

TAXPAK

Ahware, 805 Luz Ct., Danville, CA 94526, (415) 837-7346, 64K; Dos 3.3; \$39.95; (update \$30.)

THE TAX PREPARER

HowardSoft, 1224 Prospect, Ste. 150, La Jolla, CA 92037, (619) 454-0121, 64K; Dos 3.3; \$250 (update \$75.).

QUICKEN

Intuit, 540 University Ave., Palo Alto, CA 94301, (415) 322-0590, 128K; Pascalbased: \$79.

PROFIT PURSUIT WORK FORCE II

Core Concepts, P.O. Box 24157, Tempe, AZ 85282, (602) 968-3756, 48K; Dos 3.3; \$39.95 apiece.

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Due to the delicate nature of some Real Life issues, this product is not recommended for children under 13.

Sylvia Porter Goes High Tech

by ELIZABETH METZGER ARMSTRONG

YOUR PERSONAL FINANCIAL PLANNER (Volume 1 of Sylvia Porter's Personal Finance Series); Timeworks, Inc., 444 Lake Cook Rd., Deerfield, IL 60015; (312) 948-9200; includes two double-sided program disks; requires 128K, printer, a minimum of three 5-1/4-inch double-density blank disks, second disk drive optional, but advised; \$99.00.

A few years back, you often heard a comment about the "silliness" and "wastefulness" of buying a computer "just to balance your checkbook."

Whether or not there's some grain of truth in that remark, home finance software has come a long way since then. The trend today is to try to integrate all facets of financial planning into one package (thus

giving you more for your money), to design programs so easy to use the documentation is hardly necessary (streamlining the documentation in the process), and to make software so enjoyable that you won't mind spending hours and hours entering every detail of your financial life into your computer.

Sylvia Porter's Your Personal Financial Planner sets out to do all of these things. As Volume 1 in Sylvia Porter's Personal Finance Series, the program sells itself as an easyto-use, comprehensive financial planner requiring little or no expertise in financing. Backed by Sylvia Porter and the editors of Sylvia Porter's Personal Finance Magazine, Your Personal Financial Planner also tries to get you to "take charge" of your finances by giving you a mini-crash course on financial planning in both the software and documentation. "You supply the incentive," writes Porter in the introduction to the documentation, "and this program will supply the means."

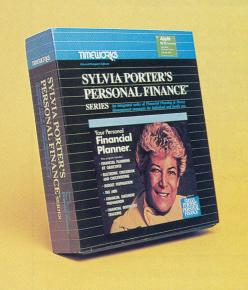
The strength of Your Personal Financial Planner is that it is, indeed, comprehensive, remarkably so for a 128K home financial package. Not only can you balance your checkbook, but you can: set up a yearly budget (by entering up to 14 budget categories, each having 10 subcategories); produce income and expense statements and balance sheets which you can then print out on hard copy, disk, or the screen; and

even plan your financial future. The program includes a built-in calculator (accessible except when bar charts and x-charts are on display) and a Mac-like "memo pad."

The most unique feature of the program is the financial planner. Using worksheet templates, you feed the program your financial dreams, and it produces a custom-designed, multipage "Personal Financial Plan" report, complete with a title page, table of contents, and very helpful glossary of financial terms. The report charts your present financial standing; financial objectives (linked chronologically and ranked by priority); the amounts you must save and/or invest each year to meet your goals; and a summary of your insurance and financial inventory records. Of all the program's features, this is by far the most practical and even fun to use. It's the section that really shows off the benefits of using a computer for financial managing, and makes this program well worth the price.

The program design is well thought out. It uses the very "friendly" and popular Mac-like "pull-down" menus. It is logically organized into six submenus for operating the program's six sections: transaction manager, budget manager, asset/liability manager, income and expense statement producer, balance sheet producer, and financial planner.

The main drawback to the pro-



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gram is that all the controls are through the keyboard, a somewhat disappointing and surprising characteristic, given the pull-down menus, 128K memory, and popularity of the Mouse among Apple users. Although all the keyboard commands appear on the screen and are very easy to master, the absence of a Mouse option makes operating the program slower and more tedious than necessary. An additional drawback is that the loading is very slow, a definite disadvantage to using DOS 3.3, particularly with a program that requires a lot of diskswapping, as this one does, even with two disk drives.

The documentation is well-organized and clearly-written. It is also way too long (193 pages including an index), since the program operations are logical and not difficult to figure out. I would have preferred something other than the traditional three-ring binder format, perhaps a short manual that briefly explained each section of the program, defined any financial terms and theories for beginners (as this one does quite well), and included a separate quick reference card listing all the menus and their functions and program keyboard controls.

As to whether it's a "waste of time and money" to use your computer to balance your checkbook and do all the things this program sets out to do, the answer is up to you. Personally, I'm still waiting for a program that will do all the "drudge" work for me—go through all those receipts, bank statements, and handdrawn tax records and enter the information into the computer. As with any personal finance program, this is one task that not even this program can do.//

Elizabeth Metzger Armstrong is a free-lance documentation writer for games and home computer software publishers. EQUALIZER continued from page 73

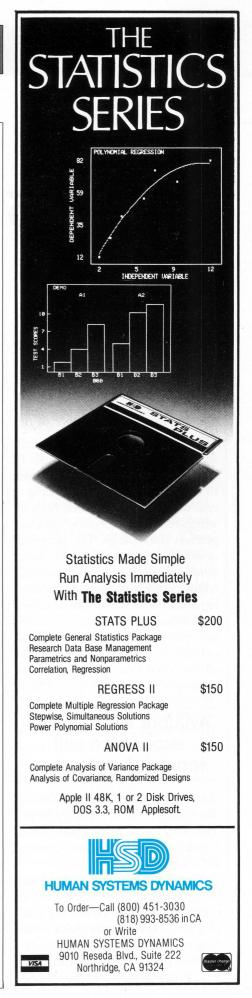
An investor can define and follow up to 26 separate portfolios, each with its unique name and account number. Cash additions and withdrawals as well as dividends and interest are entered manually by filling in the columns on the screen. Transactions to buy and sell securities are entered on a different screen.

The software provides for automatic posting of dividends and interest. Consider a particular stock held in 20 accounts on which a dividend has just been paid. Rather than making 20 separate entries on the cash screen, you can enter it once and the per share amount will be distributed to all accounts holding the shares as of the record date. A real time saver!

Of the reporting options, the portfolio report is probably the most frequently used. It shows holdings within an individual portfolio listed alphabetically or grouped by security type. Other useful reports include the following: a cross reference of accounts in which a selected security is held; realized gains and losses by account; a chronological list of cash and security transactions; and the tax status of dividends and interest received. I suspect that most users will find research and portfolio management to be the most useful elements of the package.

For the \$199 price, this is easily one of the best pieces of investment software around, and it comes with a full 30-day money back guarantee. The free access time and data base subscriptions provided with each set of software nearly pay for the cost of the package! And Schwab, in business since 1975, supports users with a toll-free number.//

Edward G. Beddow conducted the II Computing interview with Charles Schwab on page 21.



F-15 Strike Eagle

by RICH MOORE

F-15 STRIKE EAGLE; MicroProse Software, 120 Lakefront Dr., Hunt Valley, MD 21030; (307) 667-1151; Requires Apple II with 64K, IIe and IIc Applesoft in ROM, color monitor; \$34.95.

MicroProse has a great air combat simulator in F-15 Strike Eagle. It is surprisingly realistic and a bargain to boot. The only thing better is a real simulator or a fighter, both of which tend to exceed the average person's price range. The program is well done, particularly the flight dynamics, scenarios and manual. Many people will find it a challenging arcade-style game with elements of planning and strategy; but aviators, particularly those with tactical military experience, will appreciate all that MicroProse has been able to accomplish in this little gem. Flight

Aviators with tactical experience will appreciate this gem.

experience is not a prerequisite for this software, but it certainly helps. The four skill levels and seven scenarios should keep your interest for a long time.

This is not a typical flight simulator. Success is strongly tied to effective use of the Heads Up Display (HUD) with only quick scanning of the instruments in the cockpit. Any pilot who spends too much time "on the gauges" or who concen-

trates on a single item is going to find survival a tough proposition. The HUD in F-15 Strike Eagle is a good representation of an actual device, though far less cluttered. There is a lot of information in the screen displays and an extensive set of single-key commands to control all the equipment at your disposal. With practice, you can quickly master the commands.



The manual is patterned after the Air Force "dash one" series of aircraft flight manuals. You must read the manual! It contains some vital information and several good tips for successful air combat and ground attack. For example, you must fly over your base below 3000 feet to return for refueling, rearming or repairs; continuing from that point requires CONTROL-@ or pressing the joystick button only; any scenario selections at this point will restart a mission, restoring all the enemy positions you may have destroyed. There are a few difficult spots in the manual dealing with aerodynamics, air combat physics

and tactics, but they are not critical to the simulation. Skim through these sections, use the simulator, and return to them later as you build. Since the F-15 is strictly a land-based aircraft, you must use a little imagination to accept the aircraft carrier scenarios.

You will discover that you cannot safely reach some primary targets without first taking some enemy positions. A two-engine fighter such as the F-15 "starts with only half a tank of gas"; rapid fuel consumption is the fighter pilot's greatest nemesis and can down a jet as surely as enemy fire. If you are bailing out,

The only thing better than F-15 is a real simulator or a fighter.

you have only a 50/50 chance of rescue, even over your own base, so watch your fuel and don't let your jet take too much damage! The manual leaves out the two fundamental rules of air combat: (1) SURVIVE! and (2) Kill the bogey (enemy fighter). Bombs on target takes third priority. Don't ever forget the first rule!//

Rich Moore is a naval flight officer and currently the computer simulation model manager for the Naval War College's computer wargaming system in Newport, RI.

Prince

by DEBORAH KOVACS

PRINCE; Baudville, 1001 Medical Park Drive, S.E., Grand Rapids, MI 49506; (616) 957-3036; 64K, Interface: Apple Super Serial, Parallel, //c printer port, Epson APL, Grappler Serial, Grappler+, PKASO and others, Printers: Epson MX-80, RX-80, FX-80, Imagewriter, DMP, C.Itoh 8510/Prowriter, 8510SC, NEC 8023; package includes: One program disk (no backup), documentation, four ribbons (one yellow, one red, one blue, one black), "Craft Kit," featuring special paper, envelopes, cloth (for testing transfers); \$69.95.

Since the time of Icarus, mankind has tried to achieve feats before the appropriate tools were available. A recent example is a computer graphics utility that enables users to print full-color images with black-and-white dot-matrix printers.

With **Prince**, you can print T-shirt transfers, labels for diskettes, audio and video cassettes, greeting cards and even full-color patterns for stuffed toys. In its aim and conception, the program is appropriate for use by everyone in the family. However, operating the program demands a large measure of familiarity with your printer and quite a bit of patience.

On opening the Prince package, I discovered four printer ribbons. Each ribbon is a different color: yellow, red, blue, and black. The program prints one color at a time, expecting users to insert and extract ribbons at the end of each pass (on all but the Imagewriter II printer,

for which four-color ribbons are available). For printers that do not feature reverse auto-linefeed (such as the Epson series), it's also necessary to rewind the paper manually, relying on a pencil line to indicate the correct point to begin the next pass.

All this fiddling could be overlooked in a program that had other notable attributes, such as a superb graphics editor. Unfortunately, Prince contains nothing more than

The program prints out one color at a time . . .

a cumbersome text editor, which requires you to go through a complex series of gyrations to change fonts and colors, and some rudimentary editing functions, such as scrolling, cropping and erasing. The program does, however, contain an expert mode, which allows you to modify your printer's parameters to achieve such effects as variations in print size, cropping, horizontal repeating, rotations, and horizontal density.

There is a library of graphics on the disk (33 single hi-res and 2 double hi-res images, as well as 4 text fonts and 6 graphic borders). Also, Prince can load graphics from compatible graphics utilities (such as Baudville's Blazing Paddles, Pixit and Take One). In addition, there's a powerful capture feature, which allows you to freeze and save images from the hi-res screen of some other computer programs. Discovering which programs are compatible with this feature is a hit-or-miss proposition, however.

The documentation is adequate and absolutely necessary. Without it, it's easy to get lost in the program, especially for a first-time user. There is a print tutorial that effectively introduces you to the program.

If you own a black-and-white dotmatrix printer and are itching to print in color, Prince offers you that opportunity-but unfortunately, with a great deal of awkwardness. It's a product that is "just slightly ahead of its time," as they say. Using the program with an Imagewriter II is feasible, especially with a color ribbon. Using it with an Epson would be an exercise in frustration. Some may argue that it's the printers that are obsolete, not Prince, but potential users should consider whether going to all this trouble and expense to print a color image is worthwhile.//

Deborah Kovacs is a founder and former creative Director of Scholastic Inc.'s software division. She now works as a software designer and free-lance writer.

FEBRUARY / MARCH 1986

The Swyftcard

by NEIL SHAPIRO

SWYFTCARD; Information Appliance, Inc., 530 University Ave., Palo Alto, CA 94301; (800) 982-5600 U.S., (800) 562-7400 CA; \$89.95+3.50 shipping & handling; 30-day money back trial offer.

The **Swyftcard** from Information Appliance is revolutionary in concept, but somewhat rough-edged in execution. The Swyftcard plugs into slot 3 of the IIe (it will not work with other, earlier Apples or with the IIc), and gives the Apple a combination word processor, BASIC workspace with extended editor, and (with a Super Serial Card) some telecommunications capability.

To understand the Swyftcard's operation you must understand the new concept of "leaping." Let's say you are using the Swyftcard while word processing. You type the word "ramification." Later in the document you decide to move the cursor to that word. You hold down the backward leap key (which used to be the open-Apple) and type "ramification." But, as the letter "r" is hit, the cursor jumps back a couple words to the last use of the letter "r." Then, as the letter "a" is typed the cursor moves to the last use of the letter-string "ra" (perhaps highlighting the beginning of the word "raster"). As the letter "m" is typed the cursor moves to the beginning of "ram" and, finally, as you type "i," the curser leaps to the beginning of "ramification." The cursor leaps as fast as you can type.

After a leap, hold down both leap keys (open and closed-Apple) to highlight all the text from where you started the leap to the found characters. You can delete the highlighted text, much as in AppleWorks, and then reinsert it anywhere into the document any number of times.

You use leaping not only for finding words but for all cursor movement. The arrow keys will not move the cursor. (But I never stopped wishing they would.)

The Swyftcard from Information Appliance is revolutionary in concept . . .

You may within this word processing environment write and execute short BASIC programs. But even though Swyftcard is a very good BASIC text editor, the syntax-error interpreter of BASIC is not available as you type.

The telecommunications facility takes getting used to. You must highlight all lines or commands sent to the remote computer and then you must give the send command (two keystrokes). However, all incoming data comes to the word processor.

Swyftcard uses its own disk operating system. It takes only eight seconds to format a blank disk. But each disk will only hold one Swyftcard "universe" of approximately

twenty single-spaced pages. An included conversion program moves between ProDOS and Swyftcard environments.

At the current price, Swyftcard is a good value for those who need simple word processing. But it does not support such features as automatic replacing of one text-string with another, previewing printouts, onscreen formatting of margins and double-spacing. You must even center lines manually.

I hope that Information Appliance, Inc. comes out with a "Super" Swyftcard that incorporates a more powerful word processor with more features. If it does, then the Swyftcard technique of leaping may replace or supplement such things as the mouse, even for professional writers. Until then, consider the Swyftcard only if your word processing is limited to less than professional needs. The Swyftcard will swiftly get you where you want to be.

Neil Shapiro is the author of **II Computing**'s "For the Fun of It" column.

Remember!

by DAN GUTMAN

REMEMBER; Designware, 185 Berry St., Building 3, Suite 158, San Francisco, CA 94107; (415) 546-1866; 48K; \$79.95.

"I saw a ton of wash floating in a big basket next to a dam. On top of the dam a chef and his son were looking at a mad son who lost his wash."

That may be meaningless to you, but actually it's a mnemonic device to learn the names of our first four presidents—Washington, Adams, Jefferson, Madison. Another method would be to buy **Remember!** which Designware claims "is to education what VisiCalc was to financial planning." I don't know if I'd go that far, but it is one of the few programs on the market that can help a student memorize course material.

The program is fairly easy to use. You type the material to be memorized into the computer in the form of questions and answers. For example, if you're trying to learn the capitals of the 50 states, you'd type "IDAHO" as one question and "BOISE" as its answer. When you're finished, the computer presents the word "IDAHO" and you have to type in "BOISE." The program organizes the list of questions and answers, sort of like flashcards.

To help you form mental associations, the computer lets you create little hints for each question. The program contains a simple art and music program, so you can make a

drawing or tune to accompany a question. If you have trouble remembering that the capital of Arkansas is Little Rock, it might help to draw a simple picture of an ark sitting on top of a small stone. The various types of hints are available because some people remember things visually, and other people prefer to use sounds or text clues.

We also take different kinds of tests—short answer, multiple choice, essay and so on. For this reason, Remember! has been programmed

You can use drawings or tunes to help form mental associations.

to allow you to test yourself in various ways. You can respond to your original question, you can receive the answer first and provide the question (as on Jeopardy), you can receive multiple-choice questions, or the computer can put the answers in a list format. You may also set the computer to ask you the questions in the same order you entered them, or in random order.

When you've finished the test, the computer tells you how many questions you got right and which ones you missed. Then you can print out the lesson on paper.

There are a few things that prevent Remember! from being useful for serious memorization. Your questions can only be 79 characters

long, the exact length of this sentence. Your answers must be even shorter—19 characters. So you can forget about essay questions or any complicated questions. More importantly, you can ask yourself 20 questions per lesson. So if you wanted to memorize the presidents of the United States in chronological order, the program gets topped out by the time you reach James Garfield. That would be fine if we lived in 1881, but in 1985 a student needs to memorize 40 presidents.

Perhaps the program could handle more material if Designware had devoted less space to the visual and auditory hints. It's difficult to draw little graphic hints (especially without a joystick), and it's doubtful that many people can form good mental associations by inventing tunes made up of random notes.

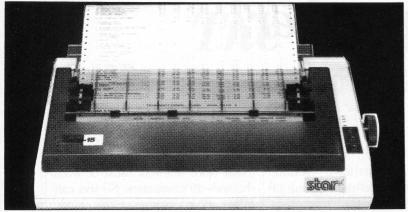
Still, Remember! can be useful for memorizing vocabulary words (in English, French, German, Spanish and Italian), dates, telephone numbers, short sections of text, chemical symbols, states and capitals, and short lists. The act of typing the material into the computer, reviewing the material, and taking a test on the material certainly promotes learning.//

Dan Gutman is the author of "Computer & Technology", a newspaper column distributed by McNaught Syndicate.

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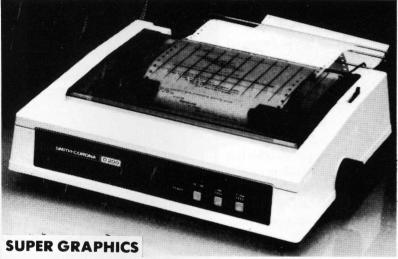
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Char. Matrix Size

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Home Data Manager

by TED SALAMONE

HOME DATA MANAGER; Penguin Software, 2600 Keslinger Road, P.O. Box 311, Geneva, IL 60134; (312) 232-1984; 64K; \$59.95.

Penguin Software, best known for excellent graphics utilities, has released an entry level database management program for 64K Apple II computers. Aptly titled **Home Data Manager**, the program provides flexibility and power without complexity. For simple record keeping, it performs well, providing good value for your money.

There are no built-in programming languages, macro routines or voluminous user manuals to intimidate you. Instead, this menu-driven application comes complete with an indexed 48-page guidebook, an unprotected master disk and a surprising amount of muscle.

Creating files, adding records or sorting by any field is accomplished with just a few keystrokes. It's equally easy to manipulate or print entire groups of records. The option screen always displays the number of records saved to disk, how many you can still enter, the active print format and the current sort field. The information is there for more than aesthetic purposes—it comes in handy during long sessions.

The default display format, an electronic version of the well-known index card, can be altered to match changing needs. Once created and

edited, these formats can be saved to disk for later use.

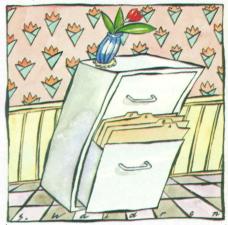
Based on the number of sort characters specified (from 5 to 9 are permissible), each file stores from 1228 to 1720 records. After working with Home Data Manager for a short time, you'll realize it allows but one file per disk. Depending on the number of files required, this one disk/one file system can be only an added expense or a nuisance as well.

Home Data Manager provides flexibility without complexity.

The program performs elementary calculations on properly designated fields, supports 132-column output and prints labels. Nonstandard printer drivers can be added, and within limits, file formats are transferrable between disks.

Home Data Manager requires that you make a backup copy before writing the system's configuration (amount of memory, number of disk drives, type of printer, etc.) to disk. Since it is not copy protected, making backups is easy. Penguin trusts you to make archival copies only.

Next, you are instructed to create a data disk, lay out the desired format and enter data—the titles of your record collection, for instance. Once that's accomplished, you can make full use of the program's sort,



printout and data manipulation capabilities.

Penguin's generally friendly menu structure helps smooth over minor rough spots such as the inability to change system parameters (type of printer, etc.) without rebooting the disk. (In this regard, Home Data Manager works much the same as Broderbund's Bank Street Writer.) Though such major changes occur infrequently, the ability to make them from within the application should be available. Help text would also be a welcome addition.

Despite these minor shortcomings, Penguin's Home Data Manager is a versatile, lightweight database management system. Potential uses are limited only by your imagination.//

Ted Salamone manages the marketing support group for Imrex Computer Systems. In his spare time, he writes for various computer publications.

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BEST SELLER CHARTS

This information was supplied to *II Computing* by IMS America Ltd.—Computer Markets Division, a market research firm located in Ambler, Pennsylvania. IMS ranks these products by dollar volume of units sold at retail. It uses a representative sampling of microcomputer software merchants in the U.S., during the six months ending August 31, 1985. Therefore, an expensive product needs to sell fewer units to outrank cheaper products.

These top-selling Apple II products were extracted from the total IMS list of 999 titles, which included non-Apple software as well. A title available for several different computers, for example The Print Shop, ranks on the basis of total sales. That is, The Print Shop for the Apple is not differentiated from The Print Shop for other machines. Nor are dollar volumes or unit sales available to us in the IMS report; this is relative ranking only.

One product, dBASE II, by Ashton-Tate, was excluded from the Top Ten because it requires a Z-80 card in Apple II computers. It would have occupied fourth position.

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- 3. **pfs:File** \$125 (database)
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- 5. The Print Shop \$49.95 (graphics utility) Broderbund Software 17 Paul Drive San Rafael, CA 94903 (415) 479-1170
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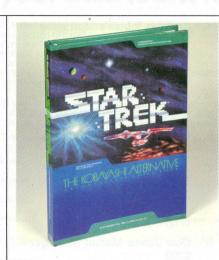
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*Please note: In the December/January 1986 issue of **II Computing** we incorrectly reported BPI's phone number. The above phone number and new address are current and correct.

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STAR TREK: THE KOBAYASHI ALTERNATIVE

Simon & Schuster Computer Software 1230 Avenue of the Americas New York, NY 10020 (212) 245-6400 64K; \$39.95

The Kobayashi Alternative is a simulation test given to Starfleet cadets. In this game, you become Captain Kirk of the popular television series, and lead the Starship Enterprise through another adventure. You are challenged to solve a mystery while the fate of all known space hangs in the balance. All the resources available to Kirk in the starship's previous adventures are available to you: phasers, sensors, and the transporter. The characters act just like they did in the show, thanks to a personality database that's part of the game.

PROMODEM 300c

Prometheus Productions 4545 Cushing Parkway Fremont, CA 94538 (415) 490-2370 \$199

ProModem 300c is a 300-baud intelligent Hayes command modem that attaches to the game port and the modem connector at the rear of your Apple IIc, climinating the need for a cable. It is contained in a tiny

plastic case, with no external power supply needed. It provides automatic redial and has a call waiting bridge to prevent disconnects when waiting tones are on the line. A built-in speaker allows you to monitor the progress of your call. It comes with ProCom-A communications and word processing software.

BUSINESSCARD

Street Electronics 1140 Mark Ave. Carpinteria, CA 93013 (805) 684-4593 \$219.95; 16K buffer kit, \$39.95, 64K, \$79.95

The BusinessCard combines the most common Apple IIe interfacing needs on one card. It is compatible with the ImageWriter II, allowing the user to print hi-res color graphics and text. It includes two serial interfaces, a clock/calendar with battery backup, and more than 60 built-in commands for printer, clock and modem applications. These commands are accessed with pull-down menus by either a mouse or the keyboard. The hi-res graphic screen printing commands include color, windowing, zoom (magnification), rotate and inverse. Text formatting features set margins, page titles, page numbers and line and page length.

ASCII EXPRESS

United Software Industries 1880 Century Park East, Ste. 311 Los Angeles, CA 90067 (213) 556-2211 64K; \$129.95

ASCII Express is a new telecommunications software package that will run on Apple's Unidisk 3 1/2-inch disk drive system. It's compatible with all popular modems, including the new Apple Personal Modem. The program lets users connect to public information databases like CompuServe and The Source, and can be used to communicate with other computers. The

package includes a tutorial that teaches installation, the basic commands, and how to dial a computer. ASCII Express also features support for baud rates up to 9600.

P-TRAL

Woodchuck Industries 340 West 17th St. New York, NY 10011 (212) 924-0576 64K; \$250

This is a user-friendly language translator that lets you convert Applesoft BASIC programs to Apple Pascal, without time-consuming recoding. **Ptral** reads the BASIC source program from disk and generates the equivalent Pascal source code. Ptral lets you port Apple II software to newer machines like Apple III, Lisa, and Macintosh. It comes with full documentation that includes a demonstration.



DESKTOP SAVERS

MicroRain Corp. PO. Box 96008, Dept. 150 Bellevue, WA 98009 (206) 462-1511 \$95-175

Here's a desktop organizer for computer owners that will cut in half the desktop space needed for a computer system. **The Desktop Saver** places the printer over the computer, and also provides space for manuals, magazines, modems, disks and other items that tend to take over your desk. It hides cables and lets you see how much paper is left.

SSI Time Machin



Destination: The 19th Century

Slip any one of these game disks into your computer, and you'll be transported back in time to the 1800's, to relive three of the most exciting periods of that century.

SIX-GUN SHOOTOUT™ will take you back to the wild, wild West. where you'll recreate the famous gun battles of such heroes/outlaws as Billy the Kid, the Earp brothers, Bat Masterson and Doc

Holliday. Imagine all the best westerns you've ever read about or seen....this action-packed game lets them come true!

BATTLE OF ANTIETAM™ brings back one fateful day, September 17, 1862, when the Gray and the Blue clashed so fiercely that it came to be the bloodiest day of the Civil War. This grand-tactical simulation is so detailed, combat is resolved down to the individual

soldier. Beginner, Intermediate and Advanced Games are provided so wargamers of all levels can try their hands at rewriting history.

COLONIAL CONQUEST™ spans the late 1800's and early 1900's that marked the Age of Imperialism. This fun and easy-to-play game of global domination puts you in charge of one of six colonial powers - the U.S., Great Britain, Germany, France, Russia, and

Japan. Your goal: To conquer the world any way you can - through subversion, espionage, or sheer military muscle.

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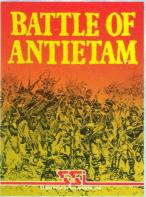
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Sitte Sont

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It is not necessary to play Transylvania before playing The Crimson Crown. Available on Apple and Macintosh computers. Requires 64K.

For information about Crimson Crown and other Penguin software, please write for a free catalog to: Dept. T, P.O. Box 311, Geneva, JL 60134.



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